What are the issues involved in using e-portfolios as a pedagogical tool?

Jeanette Marie Mills

A thesis submitted to the University of Bedfordshire, in partial fulfilment of the requirements for the degree of Doctor of Philosophy

November 2013

What are the issues involved in using e-portfolios as a pedagogical tool?

Jeanette Mills

Abstract

In Initial Teacher Training (ITT), one of the technologies rapidly being adopted to support the development of trainee teachers is the e-portfolio. Research into successful use of e-portfolios beyond their function as a repository has been scanty to date. The purpose of the current study was to extend the boundaries of understanding of e-portfolios beyond this function. This was undertaken through two in-depth case studies where e-portfolios were used as a pedagogical tool intended to support the development of reflective practice on a one year postgraduate ITT course, during two years of investigation in one university A mixed-methods approach was adopted to capture the richness of participants' self reports of their experiences, statistical data regarding interactions on the e-portfolios and analysis of reflective writing. Data were collected and analysed from questionnaires, student and tutor interviews and interactions with the e-portfolio together with analysis of the content of reflective e-journals, with a special emphasis on the place and depth of reflection. What emerged was a rich contextual understanding of e-portfolio use by trainee teachers and tutors and the problematic nature of conceptualising and assessing reflective thinking, together with the extent to which the development and depth of their reflective thinking had been supported by e-portfolio use. The results confirm previous concerns related to the training requirements of users and also the time needed for students and tutors to engage in interactions. Further they imply

that the prerequisites of successful use of e-portfolios, as a pedagogical tool, to support the development of reflective thinking include common agreement about what constitutes reflection and reflective thinking embedded within a strong, rigorous and well theorised conceptualisation of course structure and content. Implied also is the need for a well understood and transparent framework to assess the depth of reflective thinking that should complement the competencies that underpin Standards, and support the professional development of teachers.

Declaration

I declare that this thesis is my own unaided work. It is being submitted for the degree of Doctor of Philosophy at the University of Bedfordshire.

It has not been submitted before for any degree or examination in any other University.

Name of Candidate: Jeanette Marie Mills Signature:

Date:

Acknowledgements

I would like to thank all of the tutors and students who participated in this study and gave up a great deal of their time to assist in this research, for which I am extremely grateful.

I would like to express my thanks for all the help and support I have received from my colleagues at The Pilgrim Partnership. Without their help this work would remain unfinished. They provided the support and endless cover for my absence from work. In particular I would like to thank Martin who ensured that it was possible for me to prioritise my research and provided the space in my workload for this to happen.

I would also like to thank my supervisory team Janice Wearmouth and Alfredo Gaitan. Janice for her continued advice and support who encouraged me every step of the way, who never faltered in her belief that this was possible and Alfredo for his expertise and advice and for his comments on the final draft.

Finally, and most importantly, I would like to acknowledge the support and encouragement I have received from my family without this I would not have been able to complete this process.

Contents

Abstract i
List of Tables xiii
List of Figures xvi

Chapter one: Introduction 17

1.1 My position as a researcher 21
Insider and outsider perspectives 24
Ethical considerations 26
Background 28
E-portfolios at the research University 29
Implementation and reflection 31
Purpose of the research 31
Research questions 32
Post Graduate Certificate in Education (PGCE) 33
Course components 34
1.2 Structure of research report 35

Chapter two: Literature Review 37

2.1 Introduction 37
2.2 Background 38
Competencies and reflective practice 38
Teachers and technology 41
2.3 E-Learning in education contextualised 42
2.3.1 Policy leaders 44
2.3.2 Initial Teacher Training (ITT) 45
2.3.3 Future investment 47
2.4 E-portfolios defined 48
2.5 E-portfolios and theories of learning 49
2.5.1. Social constructivism 49
Underpinning theory 52
2.6 Pedagogy 53
2.7 Reflection 58
Reflective practitioners 63
Assessed reflection 67
Purpose of assessed reflection 68
Context 68
Objectivity in marking 69
The process of improving students' reflection 69
2.8 Initial Teacher Training and e-portfolios 70
2.8.1 Adoption of technology 71
2.8.2 Portfolio of evidence 72
2.8.3 Use of e-portfolio as a pedagogical tool 73
2.8.4 Successful implementation in Initial Teacher Training courses 74
Slow implementation 74
Prior experience 75
Purpose 76

Technical support 78
Management support 78
Costs 81
Technical capabilities 81
Training and support for tutors and students 83
Perceptions of tutors 84
Perceptions of students 86
2.9 Reflexivity and the researcher 88
Reflexivity through self awareness 89
Different approaches to reflexivity 91
Critique of reflexivity 92
2.10 Critique of University's approach 93
Management support 94
Slow implementation 96
Training 96
Administrative and technical support 98
Purpose for adoption of an e-portfolio 99
Assessed reflection in ITE 100
2.11 Summary 101
Theories of learning and associated pedagogy 102
Reflection 102
Adoption on course 102
Implementation 103
Research questions 103

Chapter three: Methodology 104

3.1 Introduction 104
3.2 Methodology applied to a case study approach 105
Case studies defined 106
Different types of case study 107
Constraints of case study research 110
Issue of generisalisability 110
Trustworthiness of case studies 112
3.3 Mixed methods in case studies 116
Introduction 116
Phenomenological mode of enquiry 117
Positivist mode of enquiry 117
Validity and reliability of mixed methods approaches 118
Validity 119
Reliability 122
Reflections on issues of validity and reliability in this research 123
3.4 Tools for data collection 126
3.4.1 Documentation analysis 126
3.4.2 Questionnaires – tutor and students 127
Pilot study 127
Main study 129
3.4.3 Interviews 129
Semi-structured interviews 130
Pilot study, interview process 131
Main study, interview process 131
3.5 Content Analysis 132

Interviews 132
Reflective writing 136
Grounded theory 137
3.6 Sampling 138
Pilot study, student sampling 138
Main study, student sampling 139
3.7 Ethics 140
Informed consent 140
Confidentiality and anonymity 141
Identification of University 142
3.8 Analytical framework 142
3.8.1 Analysis of course documentation – pilot and main studies 142
3.8.2 Analysis of questionnaires – pilot and main studies 143
3.8.3 Analysis of interview – pilot and main studies 143
3.8.4 Analysis of interactions – main study 143
3.8.5 Analysis of reflective writing – main study 144
3.8.6 Focus of study 146

Chapter four : Findings from pilot phase 147

4.1 Introduction 147
PebblePad 148
4.2 Analysis of data 149
4.2.1 Analysis of student data 151
4.2.1.1 Initial student questionnaire 151
Confidence in prior use of ICT 151
Routine use of electronic communication 153
Selection of sample 154
4.2.1.2 Second student questionnaire 154
E-portfolio consistency of use 154
Training and support 155
Purpose 157
Feedback 159
4.2.1.3 Analysis of student interviews 159
Content analysis 160
Analysis of issues in categories 162
‘Academic Conditions’ 162
Expectations 163
Workload and time 166
‘Technical Conditions’ 168
Skills, support and training 169
‘System’ 171
‘Scaffolding’ 172
Feedback 172
‘Experience’ 176
Purpose 177
4.2.2 Analysis of tutor data 178
4.2.2.1 Tutor questionnaires 178
Computer skills, anxiety when presented with new technologies and prior experience 179
Training needs 179
Purpose 179

E-portfolio for learning and teaching 179
4.2.2.2 Tutor interviews 180
'Academic Conditions' 182
'Technical Conditions' 184
'System Conditions' 185
'Scaffolding' 186
'Experience' 188
4.3 Discussion of findings 189
4.3.1 Student questionnaires 190
4.3.2 Student interviews 192
Course Expectations 193
Feedback 194
Lack of integration of PebblePad 195
Continued use 196
4.3.3 Tutor questionnaires 196
4.3.4 Tutor interviews 197
Feedback 198
4.4 Summary and personal reflection 199
4.5 Implications for main study 202

Chapter five: Main study- Part 1: Implementation of an e-portfolio and its use by trainee teachers 204

5.1 Introduction 204
5.2 Initial student questionnaire 205
Confidence and anxiety in computer use 205
Prior experience of using e-portfolios and preference of record keeping 206
Frequency of using email or social networking 206
Willingness to participate further 207
Understanding of purpose of e-portfolios 208
5.3 Second student questionnaire 209
Underpinning theory of social constructivism 209
Skills and technical support 210
Interaction with the e-portfolio 211
Purpose 211
5.4 Student interviews 212
'Academic Conditions' 214
'Experience' 217
'Scaffolding' 220
'System' 222
'Technical Conditions' 225
5.4.1 Positive and negative comments 227
5.5 Tutor interviews 228
'Academic Conditions' 230
'Experience' 232
'Scaffolding' 233
'System' 234
'Technical Conditions' 236
5.6 Analysis of student e-portfolios 236
Explanation of 'Tasks 'and 'Themes and Issues' 237
5.6.1 How are e-portfolios used by trainee teachers? 239
5.6.2 Student and tutor interactions on the e-portfolio 240

5.6.3 Interaction by context 242
5.6.4 Interactions with 'Themes and Issues' and 'Tasks' 243
5.6.5 Student interactions - 'Themes and issues' 246
5.6.6 Feedback – by course tutors and subject specialists 249
5.6.7 Feedback – 'Themes and Issues' 249
5.6.8 Feedback - pedagogy 251
5.7 Discussion of findings 253
Initial student questionnaires 253
Second student questionnaires 253
Interviews and analysis of interactions 254
Purpose 254
'Tasks' and 'Themes and Issues' 255
Reflection 256
Workload 256
Feedback 257
5.8 Summary and personal reflection 258
Reflection 259
Implications for ITE 260

Chapter six: Main study – Part 2: Students' reflection in the e-portfolios 264

6.1 Introduction 264
6.2 Identification of categories 267
'Personal Philosophy' 267
'School Practice' 269
'What the Literature Says' 270
'Development of Thinking' 271
'Reflection on Reading' 273
Cross comparison of reflection within categories and 'Themes and Issues' .. 274
Frequency of reflective occurrences per month 277
6.3 Analysis of reflective activity 279
6.3.1 Hatton and Smith framework of reflection 281
6.3.2 Examples of reflection from students' work 282
Descriptive Writing 283
Descriptive to Descriptive Reflection 284
Descriptive Reflection to Dialogic Reflection 286
Descriptive Reflection to Dialogic Reflection, example one 287
Descriptive Reflection to Dialogic Reflection, example two 288
Descriptive Reflection to Dialogic Reflection, example three 289
Dialogic to Critical Reflection 290
6.3.3 Occurrences of levels of reflection related to categories 291
Frequency of level of reflection per month of course 292
6.3.4 Relationship between feedback and depth of reflection 295
6.3.5 Summary of depth of reflection 297
6.4 Analysis of reflection 297
Anticipated process of reflection in course design 298
Explanation of flow diagram – Figure 16 300
Findings from content analysis 301
School Experience 301
Development in student thinking 303
Written reflections 304
6.5 Case studies 306

6.5.1 Case study one (lowest frequency of reflective occurrences) 307
Reflective occurrences for 'Themes and Issues' 309
Reflection – style of writing 310
Structure 311
Depth of reflection 312
Feedback 313
6.5.2 Case study two (high frequency of reflective occurrences) 314
Reflective occurrences for 'Themes and Issues' 317
Reflection – style of writing 317
Structure 319
Depth of reflection 319
Feedback 320
6.5.3 Case study three (mean frequency of reflective occurrences) 322
Reflective occurrences for 'Themes and Issues' 323
Reflection- style of writing 324
Structure 326
Depth of reflection 326
Feedback 327
6.5.4 Discussion of reflective writing in case studies 328
6.6 Overall discussion of findings 336
6.7 Summary and personal reflection 337
Reflection 339
Implications for ITE 340

Chapter seven: Summary and Conclusion 344

7.1 Introduction 344
7.2 The major findings of this research 344
7.2.1 What are the key factors influencing the implementation of e-portfolios? 346
Skills and preferences 346
Design of e-portfolio and course 347
Shared understanding and purpose 348
Training 349
Pedagogical tool 350
7.2.2 How are e-portfolios used by trainee teachers? 351
Student interactions 351
Method of working 352
Tutors interactions 352
Student interactions 353
Approach to reflective writing 353
Ownership 353
7.2.3 Is there a relationship between the use of e-portfolios and the development of reflective learners? 354
Purpose of reflection 354
Approach to reflection 354
Assessed reflection 355
Consistency of feedback 356
7.2.4 Do e-portfolios support continuing professional development? 357
7.3 Strengths and limitations of the research 357
Issues associated with case studies 358
Issues associated with context 359
Issues associated with conduct of research 360

Amendments to the research 361
7.4. Contribution 361
Course structure and content 362
Depth of reflective thinking 363
Assessed Reflection 364
Course tutors' understanding of reflective thinking 364
Course tutor engagement with the e-portfolio 365
Training needs 365
Student voice 365
Shared pedagogical approach 366
Digital technology 367
7.5 Implications for ITE 367
Reflection 368
Assessed Reflection 370
Inspection of ITE 371
Competencies and reflection 373
Use of digital technology 373
Continuing Professional Development 375
7.6 Implications for further research 378
7.7 Conclusion 379
Appendix 1 – Consent information letter and consent form 383
Appendix 2 – Pilot phase and Main Study initial student questionnaire 385
Appendix 3 – Student second questionnaire 387
Appendix 4 – Tutor Questionnaire 388
Appendix 5. Justification for questions 389
Appendix 6. Pilot phase and main study student interview schedule 392
Appendix 7. Pilot phase and main study tutor interview schedule 394
Appendix 8. Reflective Journal Assessment Reflection Taxonomy from Course Module Guide 396
Appendix 9. Framework for analysis of reflective writing (Hatton and Smith 1995:48) 398
Appendix 10. Pilot content analysis student interviews 399
Appendix 11. Pilot content analysis tutor interviews 402
Appendix 12. Tables relating to section 5.2 406
Appendix 13. Main study second questionnaire 408
Appendix 14. Main Study Student Initial Questionnaire data 409
Appendix 15. Main Study Student Second Questionnaire data 410
Appendix 16. Module Handbook – Description of 'tasks' (2010/11:37-47) 411
Appendix 15 – Module Handbook 2010/11 – Description of 'themes and issues' (2010/11:36-38) 419
Appendix 17 - Student Interactions With 'themes and issues' and 'tasks' over duration of course 421
Appendix 18. Interactions by sample with e-portfolio (all sections) per week of the course section 423
Appendix 19. Feedback given by tutors and specialist tutors on work uploaded by students to 'tasks' 424
Appendix 20. Feedback from Tutors to students on work uploaded to 'Themes and Issues' 426
Appendix 21. Feedback from tutors sorted into tutor groups 427
Appendix 22. Course documentation Reflective Practitioner Handbook 428
2010/11 428

Appendix 23. Student Main Study Content Analysis of Reflective Writing – masters Elements 429
Appendix 24. Students levels of reflection mapped to context coding, Hatton and Smith framework and Course Taxonomy 432
References 437

List of Tables

Table 1. PGCE Course showing weeks of course and context 34
Table 2. Research design: methods, purpose, tools 125
Table 3. Comparison on self-report of confidence and anxiety in computer use between sample and full cohort of students from initial questionnaire 140
Table 4. Students' responses to initial questionnaire on issues of confidence and anxiety associated with the use of ICT..... 152
Table 5. Students' responses to the questionnaires on issues of prior e-portfolio use, preference to paper or electronic storage, prior use of reflective journal/diary 153
Table 6. Students' responses to initial questionnaire on frequency of using email and social networking 153
Table 7. Students' responses to the second questionnaire regarding having adequate skills to use PebblePad, access to technical support and having received adequate training 156
Table 8. Time spent by students on PebblePad 157
Table 9. Frequency and mode of feedback 159
Table 10. Categories and issues within each category at three points in the course in three student interviews 161
Table 11 . Categories and issues within each category at three points in the course in three student interviews..... 181
Table 12. Time spent on e-portfolio and context for interactions 211
Table 13. Frequency of occurrences of categories appearing in the interviews of the main study 212
Table 14. Frequency of occurrences of positive and negative student comments by category in main study 214
Table 15. Frequency of occurrences of positive and negative student comments in the category 'Academic Conditions' in three interviews 215
Table 16. Frequency of occurrences of positive and negative student comments in the category 'Experience' in three interviews 219
Table 17. Frequency of occurrences of positive and negative student comments in the category 'Scaffolding' in three interviews 221
Table 18. Frequency of occurrences of positive and negative student comments in the category 'System' in three interviews 223
Table 19. Frequency of occurrences of positive and negative student comments in the category 'Technical Conditions' in three interviews 226
Table 20. Total frequency of occurrences of positive and negative student comments for the five categories in three interviews 227
Table 21. Frequency of occurrences of positive and negative tutor comments in each category 229
Table 22. Frequency of occurrences of comments in each category in three Interviews 229
Table 23. Frequency of occurrences of positive and negative tutor comments in the category 'Academic Conditions' in three interviews..... 232
Table 24. Frequency of occurrences of positive and negative tutor comments in the category 'Experience' in three interviews 233

Table 25. Frequency of occurrences of positive and negative tutor comments in the category 'Scaffolding' in three interviews 234
Table 26. Frequency of occurrences of positive and negative tutor comments in the category 'System' in three interviews 235
Table 27. Frequency of occurrences of positive and negative tutor comments in the category 'Technical conditions' in three interviews..... 236
Table 28. Frequency of occurrences of student and tutor interactions each month..... 240
Table 29. Frequency of occurrences of student sample interactions in each context 242
Table 30. Frequency of occurrences shown as an average for the student sample in the different contexts 243
Table 31. Interactions by the seventeen students in the sample group in four contexts on 'Tasks' and 'Themes and Issues' – mean and standard deviation 245
Table 32. Interactions by the seventeen students in the sample group in four contexts on 'Tasks' and 'Themes and Issues' – correlation 245
Table 33. Frequency of occurrences of tutor feedback on 'Themes and Issues' each month 252
Table 34. Frequency of occurrences of codes for category 'Personal Philosophy' identified in students' e-portfolio 268
Table 35. Frequency of occurrences of codes for category 'School Practice' identified in students' e-portfolio 269
Table 36. Frequency of occurrences of codes for category 'What Literature Says' identified in students' e-portfolio..... 270
Table 37. Frequency of occurrences of codes for category 'Development of Thinking' identified in students' e-portfolio..... 272
Table 38. Frequency of occurrences of codes for category 'Reflection on Reading' identified in students' e-portfolio..... 273
Table 39. Frequency of occurrences indicating reflective thinking by category within 'Themes and Issues'..... 275
Table 40. Frequency of occurrences of reflective thinking by month and Category 278
Table 41. Occurrences of levels of reflection related to categories..... 292
Table 42. Frequency of levels per month 293
Table 43. Occurrences of student interactions and tutor feedback during February..... 295
Table 44. Changes in level of reflection following feedback..... 296
Table 45. Case study one - frequency and percentage of coding per category 308
Table 46. Frequency and percentage of total coding in each theme 309
Table 47. Case study one – coding of reflection using Hatton and Smith Descriptors 312
Table 48. Case study two - history of use of e-portfolio for 'What is Learning?' 315
Table 49. Case study two - frequency and percentage of coding per category 316
Table 50. Case study two - frequency and percentage of total coding in each theme 317
Table 51. Case study two – coding of reflection using Hatton and Smith descriptors 320
Table 52. Case study three - frequency and percentage of coding per category ... 322
Table 53. Case study three - frequency and percentage of total coding in each theme 324

Table 54. Case study three - coding of reflection using Hatton and Smith Descriptors 327
Table 55. Comparison of frequency of reflective occurrences by category for case studies 331
Table 56. Comparison of Hatton and Smith descriptors for case studies 332
Table 57. Percentage of statements classified using Hatton and Smith (1995) framework of reflections 333
Table 58. Content analysis for those students who score higher than 27 per cent for ‘Dialogic’ and ‘Critical’ depth of reflection 333

List of Figures

Figure 1 Screenshot of Webfolio on PebblePad 166
Figure 2. Student dissatisfaction – issues connected to lack of tutor skill 193
Figure 3. Tutor dissatisfaction – issues connected to PebblePad as the tool 197
Figure 4. Students' positive comments classified by category 214
Figure 5. Students' positive comments 'Academic Conditions each interview .. 217
Figure 6. Students' positive comments 'Experience' each interview 220
Figure 7. Students' positive comments 'Scaffolding each interview 222
Figure 8. Students' positive comments 'System' each interview 224
Figure 9. Students' positive comments 'Technical Conditions' each interview .. 226
Figure 10. Students' positive comments classified by category across the three Interviews 228
Figure 11. Tutors' positive comments classified by category across the three interviews 230
Figure 12. Main study total interactions by tutors and students per month of the course 241
Figure 13. Box and Whisker diagram showing ranges of interactions on 'Themes and Issues' (RPM) and 'Tasks' in the four contexts 246
Figure 14. Interactions per week on Reflective Practitioner Module – 'Themes and Issues' for sample group 248
Figure 15. Five thematic category codes displayed as percentages 267
Figure 16. Process of anticipated reflection as understood from course documentation and tutor interviews 299
Figure 17. Process of reflective activity as understood through content analysis of written work 302
Figure 18. Case study one- reflection coded each month per category 308
Figure 19. Case study one – reflection against Hatton and Smith descriptors 313
Figure 20. Case study two- reflection coded by level each month 316
Figure 21. Case study two – reflection against Hatton and Smith descriptors 320
Figure 22. Case study three - reflection coded by level each month 323
Figure 23. Case study three – reflection against Hatton and Smith descriptors ... 327

Chapter one: Introduction

This research explores the use of the e-portfolio as a pedagogical tool from the perspective of tutors and students by asking what factors influence successful implementation of this technology, with an emphasis on its role in supporting reflection.

This research makes an important contribution to both the field of initial teacher education within a university context and the field of digital educational technology. The thesis reports a study of the examination of the implementation process of a new e-portfolio, and how this technology was used as a pedagogical tool to encourage trainee teachers in reflecting and developing their practice. Its originality lies in the way the in-depth case studies are able to lay bare issues associated with the design, implementation and assessment of courses intended to support the development of reflective thinking, and also the use of the e-portfolio during the course, specifically: at which points it was used, how often and for what purpose. In particular it raises issues related to the importance of,

- a strong rigorous clear conceptualisation of course structure and content that is well rooted in theoretical understandings of learning, which are compatible with the concept of reflective thinking and practice. This should be thoroughly understood by both tutors and students,
- considering how assessment of the depth of reflective thinking might be approached when reflective thinking and practice are, themselves, contested concepts that do not sit comfortably with a competency/skills based approach. Meeting competencies suggests 'the possibility of completeness' (Standish 1995:133), with the assumption that there is only one right way of doing things (Moore 2007). Reflection, within these competency Standards, is required as a

skill to demonstrate that trainee teachers have met the Teachers' Standards suggesting that a trainee can be assumed as competent if they provide evidence of doing so. However, when an attempt is made to assess reflection, with the application of a rigid structure, then the assessment becomes problematic as it is applied to a dynamic process that attempts to measure the level of reflection as a measure of competence and academic attainment. This implies a need for policy makers, both at national and local level, to understand and acknowledge that competencies and skills and different approaches may rest on different theoretical assumptions about views of mind and learning, but that in the life of a professional, technical mean –ends, competency-based approaches and reflective thinking both have a role (Moore 2007), and as suggested by Hackett (2001) it is possible that the two concepts may be complementary.

- sharing the problematic nature of assessing reflective thinking with colleagues and students alike, and also sharing the resolution of the dilemma in a clearly elaborate assessment framework within the course structure,
- the points in the course at which the students interacted on the e-portfolios, either through choice or by necessity. This was particularly important in relation to tutor support for formative feedback, and requires consideration in course design to ensure that assessment points recognise the times when students are able to interact with the e-portfolio. Therefore, those setting assessment points need to ensure the availability of tutor time, but also the context of the trainee teacher's experience to enable a student to respond,
- the issues associated with the importance of the degree to which course tutors understand reflection in the context of courses using technology of this sort, and how best to scaffold the learning through feedback in order to encourage

reflection at a deeper level. This highlights the problems associated with assessing reflective thinking as if it were a product rather than a process, placing the importance on the 'artefact' rather than the learning journey,

- the issues associated with time requirements for tutors to engage with the dynamic, changing nature of students' thinking. The way in which course designers conceptualise and respond to meeting the needs of all learners is problematic when dealing with people who require different levels of support at different times in the course, whilst also responding to the constraints imposed by policy both at national and local (University) level. For example, there are fixed course start and end dates, deadlines for examination boards, deadlines for administration purposes, timescales for reporting recommendations for the award of QTS, and so on,
- listening to the voice of those implementing the e-portfolio, the tutors, and additionally the voice of trainee teachers who use this technology, a group that commonly are not heard. Student voice is important for two major reasons. Firstly is the pragmatic issue of evaluating what they say. This is important given the assessment regime applied to all Providers of ITT where students, both past and present, contribute to the judgement on the quality of training offered. Secondly the conceptual issue concerned with the model of learning, to ensure that the social constructivist model of learning which the students as trainee teachers are expected to use in the classroom is also applied to them as learners. This needs to be modelled very clearly in the feedback given and the way in which tutors deliberately try to understand the students current level of understanding so they can support them in further learning through the 'zone of proximal development' (Vygotsky 1978). As the course at the centre of this

research had an underpinning assumption of socio cultural, constructivist theory, then this should have permeated the whole course, with tutors listening to the students,

- training needs of both tutors and students to use the technology and ensure conceptual understanding of how this could be used to support the development of reflective thinking.

What emerges through the research is confirmatory evidence of previous research related to the implementation process as documented in chapter 2 such as slow implementation, prior experience, shared purpose, technical/management support and the training of tutors and students, together with a rich contextualised understanding of how, and at which points in the course, the technology was utilised by trainee teachers and tutors. In addition, it lays bare the issues listed above from the in-depth exploration of the case studies. The methodology used and the results of these case studies are documented in the following chapters. In particular, the importance of how the student interacts with the e-portfolio, together with the timeline and identification of the context, and the student response to feedback is investigated in detail in chapter 5. The analysis of the student interactions also explores the frequency of interactions on different elements of the course, revealing how students managed the different demands of the course. The development of reflection, as evidenced through the use of the e-portfolio, is analysed in detail in chapter 6, contributing to the body of knowledge with regards to how can the e-portfolio support the development of trainee teachers, in order to develop their reflective thinking and practice.

Reflective thinking is an integral part of the current study. This current chapter, therefore, sets the scene for the research with my reflections on my own identity as a teacher and researcher, briefly exploring the background to the adoption of e-portfolios in

Initial Teacher Training (ITT), explaining the purpose of the research and introducing the context. This is followed by an outline of the course content within which this study was conducted. Finally an outline of the structure of the thesis is provided.

1.1 My position as a researcher

As researchers we explore what is of significance to us, with regards to our identities and position (Clark & Sharf, 2007; Guillemin & Gillam, 2004; Mehra, 2001). The timeline of my experience working as an educator has spanned the duration of the government's drive to embed ICT in schools from the introduction of computers, through New Opportunity Fund (NOF) training, free laptops to teachers and, in both schools and universities, the introduction of internet connectivity and the use of Virtual Learning Environments (VLEs). Interest in carrying out research within this area stemmed from my career as a primary teacher with responsibility to coordinate Information and Communication Technology (ICT) within a school. As a teacher in a classroom using ICT at a fairly early stage in its development, for example using graphing software packages to support science, I could see the potential for supporting children's learning. In addition I wanted to support other members of staff who were not as confident as me to enable them to use technology in their classrooms. This was followed by work as a county advisor promoting the use of ICT in schools where I supported schools in using technologies to enhance learning. Finally in my current position as an educator managing a graduate teacher training course, external to a University, I began to see the potential of using technology to support the learning of trainee teachers.

The above is my personal experience, or an outline narrative of how my career has been developed, and it is important to understand my personal story as this has shaped who I am and the beliefs I hold and has an influence on my current interests. As a researcher I

bring with me a complex mix of situated experiences from lifestyle and my career, from dispositions, my values, expectations and biases. This background is referred to as *habitus* (Bourdieu 1989), it is the structure and totality of me as an individual and my thoughts, or my story. It is through my personal experience and reflection on that journey that has shaped my beliefs, as suggested by Mair 'any understanding we have of reality is in terms of our stories and our story-creating possibilities' (1988:128). As noted by Finlay researchers need to be aware of their role in the co-construction of knowledge:

> 'Most qualitative researchers will attempt to be aware of their role in the co-construction of knowledge. They will try to make explicit how inter-subjective elements impact on data collection and analysis in an effort to enhance the trustworthiness, transparency and accountability of their research.'
>
> (Finlay 2002:212)

Therefore it is important to understand how we position ourselves in the research we carry out and to acknowledge that the interpretive system we adopt is rooted in our history, and reflection is part of that narrative, in order to make sense of the meanings we construct:

> '... it is culture, not biology, that shapes human life and the human mind, that gives meaning to action by situating its underlying intentional states in an interpretive system. It does this by imposing the patterns inherent in the culture's symbolic systems – its language and discourse modes, the forms of logical and narrative explication, and the patterns of mutually dependent communal life'
>
> (Bruner, 1990:29-30)

As I developed my work as a teacher educator, the adoption of technology in teacher education was driven by the Training and Development Agency (TDA). One of the initiatives that the TDA encouraged was the use of e-portfolios. It was therefore important to me, as an educator, to develop an in-depth understanding of how e-portfolios might be used on teacher training courses to support trainee teacher learning. My driving commitment to support my own students to use approaches that were being promoted by

TDA and my uncertainty about the use of e-portfolios and how they would support my own students' learning, led to research in this technology.

Coincidental with my interest in the possibility of introducing e-portfolios on my own teacher training course was a realisation that colleagues in the local University were planning their introduction on a parallel course. It was the use of e-portfolios on the University course, not mine, that was the topic of my research study. My only connection with the University was as a student researcher as my employment was with an independent provider of teacher training. Therefore, the focus of the research was within a parallel course offered by a Provider that was not my own, with the intention of looking at the introduction of an e-portfolio over the period of two years in order to develop a deep understanding of the learning of both tutors and students. Hence, my role as researcher may be perceived as an 'outsider' looking in. I discuss this issue further below.

It is important to understand my identity within the research as explored above as this has a bearing on how the research was conducted from my position with a background in education, but equally important to understand the change of emphasis and focus of the study as the research developed. This aspect of the research is discussed later in this chapter and fully in the methodology chapter, but here I outline briefly the path of the research that I followed. I had intended to carry out this research with my own students but, on reflection, considered this to be inappropriate as I was in the role of assessor in relation to my students. I understood that researching my own students would have been problematic as I was in a position of power as an assessor and manager of the training course. This power relationship may have resulted in participants telling me what they thought I wanted to hear, rather than what they thought. I decided, on reflection, that research on the University course would be less problematic.

Initially I thought this research would study the perspectives of the tutors and students using the e-portfolio together with patterns of the frequency of use for each course element, occurrences of interactions in respect of timeline of course, context and amount of feedback given derived from quantitative data. This was achieved, but in addition, it became obvious that issues related to what constitutes reflective thinking, and the assessment of this was crucial to an understanding of how e-portfolios can be used as a pedagogical tool on a course that purports to support the development of reflective practitioners. The study, therefore, also tells a story regarding reflection and its assessment, and this became a major part of the research. All student participants were informed that I was not a University employee and would not be teaching or assessing their work. Therefore, as an outsider issues regarding objectivity of marking (Hartmann & Calandra 2007), and honesty of student reflection who may be attempting to please those who they perceive to be in power (Hargreaves 2004) did not arise. Had I been an insider then issues regarding pseudo reflection and the students saying what they felt I wanted them to say, rather than actually reflecting on what is going on in their reflective thinking would have needed to be taken into consideration as documented in section 2.7 'assessed reflection'.

Insider and outsider perspectives

As stated above, I could be seen as an outsider as I was not involved in teaching on the course at the centre of the study, and I did initially consider myself to be an outsider with the advantages this brings. Fay (1996) suggested four reasons why outsiders may be better placed as researchers. Firstly insiders can be so close to the experience that they are not able to adequately distance themselves. Secondly the complex features of human experience such as feelings, desires and motives may mean that insiders cannot see through this complexity. Thirdly they may not be able to see issues objectively from

multiple perspectives and make connections, see patterns and influences due to their experiences. Fourthly as human beings we self-protect for many different reasons and an outsider, who is external, may see the experience more clearly because they are detached from the experience.

However, as a student of the University and a professional working within ITT I could also be perceived as an insider knowing the systems of the University as a student, and knowing the principles of teacher training in England. In addition, as the research evolved, I became closer to the participants, particularly the tutors whom I followed for the two-year period. Therefore, my position was, as suggested by Dwyer and Buckle (2009), difficult to know and maybe somewhere in between insider or outsider, and the boundaries seem blurred when positioning the research. The blurring of boundaries may have occurred particularly through the conversations that took place in my role as interviewer, which may be described as a position of 'confidant'. It was important that I was aware of the implications of being an insider or outsider as outlined above and how my identity might frame the reporting as explained by Maykut and Morehouse as:

> 'The qualitative researcher's perspective is perhaps a paradoxical one: it is to be acutely tuned-in to the experiences and meaning systems of others—to indwell—and at the same time to be aware of how one's own biases and preconceptions may be influencing what one is trying to understand.'
>
> (Maykut & Morehouse 1994:123)

However, as Dwyer and Buckle speculate, it is not a case of being one or the other:

> '..... the core ingredient is not insider or outsider status but an ability to be open, authentic, honest, deeply interested in the experience of one's research participants, and committed to accurately and adequately representing.'
>
> (Dwyer & Buckle 2009:59)

Ethical considerations

As an employee of what could be perceived as a 'rival' ITT provider to the University, issues concerning access to commercially sensitive material as well as access to individuals were considered throughout the research and, as suggested by Wellington (2003), were at the forefront of the project from beginning to end. I addressed these issues by ensuring that I did not share any aspects of the course or course information, nor did I incorporate any University material in my own course, absolute confidentiality over University material was maintained throughout the research.

In order to address the research questions, participation was from tutors and students, and I gave a voice to both parties, raising issues of protection of participants' interests and perceived power relationships. The issues of being an insider and assessing work did not arise as I was not in the position of assessing any of the work undertaken by the students. This would have been an issue if I had been involved with assessing work. This is because if student reflection is perceived to be at variance to the tutor marking the reflection and, therefore in a position of power, the student may respond by writing what they believe the tutor wants them to say (Sutton, Townsend &Wright 2007). Objectivity in marking with respect to the tutor/student relationships is discussed in chapter 2.

The four principles when engaging participants in a qualitative study put forward by Meara and Schmidt (1991) were considered in the formulation of the research process, as follows:

- Firstly is respect for autonomy by recognising and taking into consideration the independence and wishes of the participant. This was achieved through voluntary involvement with informed consent and the offer of withdrawal from the process at any stage.

- Secondly is that the participants will not be harmed or distressed by their involvement, in my research the participants had the opportunity to withdraw at any time and remained anonymous. However, potential harm is difficult to quantify as illustrated by Guillemin and Gillam:

> 'The potential harms to participants in qualitative social research are often quite subtle and stem from the nature of the interaction between researcher and participant. As such, they are hard to specify, predict, and describe in ways that ethics application forms ask for and likewise, strategies for minimizing risk are hard to spell out.'
>
> (Guillemin & Gillam 2008:272)

  Informed consent and opportunity to withdraw did not address issues relating to the perceived power relationship possibly felt by participants. Power issues were considered with regards to whose research, research for whom, research in whose interests and that research should be empowering to all participants (Scott & Usher, 1996). It could be perceived that this research centred round the power of me as an outsider with insider knowledge receiving the rewards in the form of recognition of the research, and, that this reward was potentially shared by the University in the form of a successful research student. The tutor participants were rewarded with the expected recommendations to improve practice. Leaving the student participants powerless as their involvement did not reap any personal rewards as the reward of widening understanding and theory with regards to the use of e-portfolios would be for future students, not the student participants. Nevertheless, participation by students gave them a 'voice' and allowed them to be heard which gave them power in being able to express their opinions.

- Thirdly the researcher should strive to work for the benefit of all participants. The final principal of justice, Meara and Schmidt (1991) suggest is achieved through

the commitment of fairly distributing responsibilities and rewards between researcher and participant. Within the research I ensured that all participants had the opportunity to express their views individually through questionnaires and interviews, and I ensured that these views were reported anonymously. This principle is particularly important when considering the representation of the cohort through sampling, and it has to be acknowledged that certain groups in society exert more power than others (Cohen *et al* 2011) and that some groups were not represented in the student interview sample. This is discussed in the methodology chapter. Also to be considered is the issue of perceived power in interview situations as a consequence of how questions are asked, how the interviewer dresses and the location of interviews (Ruben & Ruben 2012).

Background

The development of e-learning and in particular the use of e-portfolios is rapidly becoming an integral part of ITT in the UK (Mee 2008). The introduction of this initiative appears to be in response to the Government's e-strategy that stated all pupils should have a 'personal online learning space where they can store their own course materials and assignments in digital form, and record their achievements' (DfES 2005:3).

This raises two points for Providers of ITT who are required to,

- respond to the government's e-development agenda by ensuring that trainee teachers are competent in using ICT to support learning in schools where ICT is in common use
- provide training so that trainee teachers understand how children learn and how to support learning. One way of achieving this is to have a clear focus on trainees' understanding of how they learn themselves.

The introduction of an e-portfolio is one way of amalgamating these two lines of thinking: the drive from government to facilitate e-development together with a wish to increase provider's accountability for enabling trainees to understand learning better. Therefore, the e-portfolio can be used as a pedagogical tool to address government's requirement and enable trainees' ability to support reflection and reflective practice.

As a consequence ITT providers have variously adopted proprietary software from the diverse range being offered in the market place. These include Pebblepad, Moodle, Blue Sky, Paragon, E Folio and other bespoke systems as the TDA (2008) comments. The expressed purpose of the use of e-portfolios varies from establishment to establishment, but it is a widely held belief that they encourage the trainee teacher to become a reflective practitioner (Young 2008). This concept is shared by the University where the research took place where their use is driven by the notion that they encourage reflection (Primary PGCE Primary Professional Development Profile - Reflective Practitioner Handbook 2009/10 and 2010/11).

E-portfolios at the research University

The system adopted by the University since 2009 was PebblePad (Personal communication from Director of Teaching and Learning 2010[1]). Previously the University had used its Virtual Learning Environment (VLE) for delivery of course material. The reasons given by the Director of Teaching and Learning for the decision to adopt PebblePad as the e-portfolio are as follows:

> 'The system puts a clear focus on the process of personal development, capturing evidence rather than focusing on e-portfolios as the outcome. Many users find it quite simple to use, certainly to capture evidence of learning and development. The interface makes it accessible, supporting people in recording the outcomes of

[1] The identity of the participating University had been withheld in accordance with Ethics Committee recommendations.

> their learning and capturing it. PebblePad is an English company, focusing on this one product created by those who have worked in the field of Higher Education, who therefore have an intimate knowledge of the needs of the sector.'
>
> (Personal Communication from Director of Teaching and Learning 2010[2])

This e-portfolio, PebblePad, is described by its authors as a 'personal learning system'. The co-author of the system expresses his definition of e-portfolios as 'a purposeful aggregation of digital items – ideas, evidence, reflections, feedback, etc., which presents a selected audience with evidence of a person's learning and/or ability' (Sutherland 2010:viii) . He goes on to describe his opinion on the way in which a 'personal learning system' is used:

> 'The sense that it is 'my place', a personal place but a place from which I can choose to connect with others. It is a place where my thoughts, ideas and aspirations can be more easily articulated through the supporting structures it contains. It is conversational, though not always in an easy way. This place challenges me, encourages me to deconstruct, analyse, reflect and reconstruct and it provides opportunities for social enrichment of my learning experiences. Of course, my personal learning space also allows me to create multiple e-portfolios for myriad purposes and diverse audiences.'
>
> (Sutherland 2010:ix)

In summary, therefore, Sutherland (2010) sees PebblePad as more than an e-portfolio, but as an on-line personal space that can be used for multiple purposes such as personal development planning, continuing professional development, learning, teaching and assessment. At the beginning of the academic year 2009/10 it was not possible to embed PebblePad in every course due to technical problems. By the end of the academic year 2009/10 the Director of Teaching and Learning reported that these issues had been successfully resolved and the system was accessible to all members of the University community.

[2] The identity of the participating University has been withheld to prevent identification of individual members of staff.

Implementation and reflection

The issues that influence the successful implementation of e-portfolios in ITT have been widely documented as student and tutor buy-in, motivation, understanding the purpose, training, technical support, demands on tutors and efficient use of student's and tutor's time (Heath 2005; Pecheone, Pigg, Chung & Souviney 2005; Tosh, Light, Fleming, Haywood 2005; Haywood, Anderson, Coyle, Day, Haywood, MacLeod 2000; Strudler & Wetzel 2005). What is missing is an in-depth study into how an e-portfolio, adopted as a pedagogical tool, is used by students and tutors, and if the use is associated with the development of reflection and how this process evolves.

Purpose of the research

The purpose of the current research was to investigate the pedagogical use of the e-portfolio to better understand the key factors that influence implementation together with how trainee teachers, supported by their tutors, use this technology in order to construct new understanding. The e-portfolio was adopted in the context of the course as a pedagogical tool underpinned by social constructivist assumptions about learning, in order to encourage reflective practice by trainee teachers with the support of the more informed other, that is the tutor. To explore the purpose it was necessary to investigate how this technology was implemented and used by students and tutors, such as the pattern of use, frequency of use, influence of feedback, student location while they were interacting on the e-portfolios and nature of student tutor interactions was achieved from collecting quantitative data in relation to the use of the e-portfolio and qualitative date from tutor and student interviews, and the opportunities the e-portfolio presented for continuing professional development. However, as the research developed it became clear that assessed reflection was a vital aspect of the e-portfolio and in the second year of the study the analysis of the students' reflective writing became a major part. Therefore,

my position changed from the expected reporting of a predominantly quantitative study to a predominately qualitative study. This is explored fully in the methodology chapter and reported in chapter 6.

Critics of the increasing use of technology in training include Roblyer and Knezek (2003) who question whether or not students and institutions should use technology more and question why they are using technology more. As suggested by Steffens, 'it is difficult to find hard evidence for the impact of new technologies' (2008:230) and Strudler and Wetzel recommend:

> 'We need a range of studies that inform whether the large-scale implementation of electronic portfolios in teacher education is ultimately a good idea that should be pursued and sustained in the coming years.'
>
> (Strudler & Wetzel 2005:243)

In order to explore the issues raised by those questioning the use of the e-portfolio, it was intended that the outcome of the research should provide some in-depth insights into how, in two case studies, the technology was used. Therefore, the main objectives of the study were to investigate (a) the implementation process of e-portfolios, (b) how e-portfolios are used to support trainees in evidencing pedagogic and professional competency against the Qualified Teacher Status (QTS) standards, (c) the relationship between the use of e-portfolio and the development of reflective learning, and (d) the impact that e-portfolios have in supporting continuing professional development.

Research questions

The research questions arising from the aims and objectives were:-

1. What are the key factors influencing the implementation of e-portfolios?
2. How are e-portfolios used by trainee teachers?

3. Is there a relationship between the use of e-portfolios and the development of reflective learners?
4. Do e-portfolios support Continuing Professional Development?

In order to address the research questions, this study investigated how two subsequent cohorts of trainee teachers used e-portfolios whilst studying on one year Initial Teacher Training (ITT) Course. The researched activities included:-

- the students' interactions with the e-portfolio with regard to frequency, context and response to feedback,
- the perceptions of students and tutors of the experience of using an e-portfolio,
- the choices to work in terms of place and depth of reflection on the materials uploaded by the students for the Masters element of the course,

In the first year of research (pilot phase cohort one) PebblePad, a commercially produced e-portfolio, was adopted for the course, incorporating a range of tools, marketed as a personal learning space for multiple uses accessible through the internet. The course tutors made the decision to discontinue using this e-portfolio after the first year due to the problems encountered (see chapter 4). For the second year of research (main study cohort two) the tutors designed a bespoke e-portfolio using tools (wikis) available on the University Virtual Learning Environment (VLE) allowing the trainees to complete and upload work to be assessed against course criteria.

Post Graduate Certificate in Education (PGCE)

The study focused on the use of an e-portfolio as a pedagogical tool in a one year Primary Post Graduate Certificate in Education (PGCE) course, leading to Qualified Teacher Status (QTS) at the research University. This is a thirty-eight week course with an assessed placement-based experience of ninety-eight days. The course ran from the

beginning of September to the beginning July (2009/10 pilot phase, 2010/11 main study), see Table 1.

Table 1. PGCE Course showing weeks of course and context

Weeks 1 – 3	Campus
Week 4	School placement
Week 5 – 8	Campus
Weeks 9 – 10	School placement
Week 11 – 12	Campus
Weeks 13 - 14	School placement
Week 15	Campus
Weeks 16 – 20	School placement
Week 21	Campus
Weeks 22 – 25	Research or placement abroad for Modern Foreign Language students
Week 26	Campus
Weeks 27 - 29	School placement
Week 30	Campus
Weeks 31 – 38	School placement

For the cohort 2009/10 ninety students were enrolled and for 2010/11 there were one hundred. These students were divided into six tutor groups for the duration of the course. When in University students met as a tutor group each Friday. When on school placement students may have been on their own or with another student. This was dependent on the size of the school and the number of students the school was willing to train. Whilst in school all students were supported by a school-based Mentor who was a member of the school staff and they were visited by a University tutor.

Course components

The students were expected to complete a Reflective Journal, otherwise known as the e-portfolio, following guidance laid out in the course documentation 'Primary PGCE Primary Professional Development Profile - Reflective Practitioner Handbook', and upload evidence for the purpose of assessment using the e-portfolio. This Reflective Journal had two distinct sections as follows:-

- twenty-six ‘Tasks’ were set by course tutors working on professional study aspects of the course and two subject specialists. Twelve ‘Tasks’ were set by the course tutors, six ‘Tasks’ by the mathematics tutor and eight ‘Tasks’ by the English tutor. All these ‘Tasks’, with the exception of the pre-course and the subject audit set by course tutors, were ‘in-school’ activities that were developed to enable the students to meet the standards and competences in order to be awarded QTS.
- discussion of ‘Themes and Issues’. This consisted of nine titles with ‘prompts’ covering current educational issues. Changes were made to course content as a result of the student experience in the pilot study; this is discussed in detail in Chapter 4. The students were required to select five titles to address at Masters Level and four at Professional Level that is, postgraduate but not Masters Level. The students were asked to compose this assessed work by reflecting on their reading of research and theory, University sessions and school experience. It was the intention that a diary or journal would be kept on the e-portfolio, updated on a weekly basis, documenting the development of the work. This would be formatively assessed at four points during the year by feedback through the e-portfolio. Successful completion of this element of the course gave the students 60 credits at Masters Level. It was this element (‘Themes and Issues’) that was examined in relation to the development of reflective thinking discussed in Chapter 6.

1.2 Structure of research report

This thesis is structured into seven chapters. Each chapter represents a distinct area of the research and these chapters are synthesised in the final chapter.

Chapter 2 - Literature review

Chapter 3 - Methodology

Chapter 4 – Findings from pilot phase

Chapter 5 – Main study – Part 1: Implementation of an e-portfolio and its use by trainee teachers

Chapter 6 – Main study – Part 2: Students' reflection in the e-portfolios

Chapter 7 – Discussion and Conclusion

Chapter two: Literature Review

2.1 Introduction

Following an extensive search of literature, seven key areas were identified for investigation in this chapter and are grouped together into seven sub-sections below. These seven key areas focus on the development of technology and the influence this has had in the training of teachers, with a particular focus on the use of e-portfolios to support the development of reflective practitioners. Therefore, the chapter begins by investigating the background to the funding within education then explores e-portfolios and associated theories of learning, pedagogy, reflection, e-portfolios in ITT. In addition a section exploring the concept of reflexivity and, finally, a critique of the University's implementation of an e-portfolio is discussed.

Government funding of technology within mainstream education for hardware, software, training for teachers and broadband connectivity has seen the investment of large amounts of public funds to ensure that all pupils benefit from the opportunities that technology brings to the learning experience. This is explained through the literature together with how this has influenced the training of new teachers. The chapter then defines e-portfolios in broad terms with an explanation of their use together with the underpinned theory of learning. What follows is an examination of the literature relating to pedagogical principles as it is a generally held belief that if e-portfolios are to be successful, tutors need to understand the implication of the underlying pedagogical principles which are ultimately derived from the view of learning as well as the expected outcomes.

It is a widely accepted that trainee teachers should be encouraged to become reflective practitioners. Therefore, the seminal works of Dewey (1933), Schön (1983, 1987) and Habermas (1971) are explored to understand the process of reflection and how e-portfolios can be used as pedagogical tools to support the development of teachers by assessing reflection. This is followed by a section on the use of e-portfolios in ITT for documenting the progress of the training process, exploring the factors that reportedly influence the implementation of the e-portfolio as a pedagogical tool. Finally, when considering my journey as a researcher the concept of reflexivity is explored and a critique of the process by which the use of e-portfolios was conceptualised and employed at the research University is given.

2.2 Background

Competencies and reflective practice

All trainee teachers are required to provide evidence that they meet a set of competency Standards in order to qualify for the award of QTS. These Standards have evolved over time from a set of 'competencies' published in 1992, to the current competencies referred to as 'Teachers' Standards' introduced from September 2012 (DfE 1992; DfEE 1997; DfES 2002, DfES 2007, DfE2012). The competencies or Standards reflected the government's policy with regards to curriculum initiatives and have been referred to as a technical rational approach to teacher training (Wearmouth 2002; Furlong 2005). This implies that the 'ends' to be achieved are straightforward, through the process of training to be a teacher as a means of acquiring evidence to meet the specified goals. Hackett suggests that the purpose of competency-based training is:

> '...to ensure that individuals attain accepted specific and generic skills in the practice of their professions'
>
> (Hackett 2001:111)

The goals to reach, the competencies or Standards, are known and used by all Providers of ITT to assess all trainee teachers for the suitability for the award of QTS. This would infer that if a trainee teacher adopts a particular technique, follows a particular programme of training or selects a suitable strategy then they will be demonstrate they are competent in meeting the Standard. Competencies are constructed as 'being generally applicable across the different contexts and situations in which learners and workers exist' (Chappell, Gonzi & Hager 2000:204). Standards, which are a set of competencies, in the context of ITT adopt a narrow understanding of the term competency that is the demonstration of the performance of an individual (Moore 2007). This has been referred to as a behaviourist approach to teacher training (Furlong, Barton, Miles, Whiting & Whitty 2000). Moore goes on to suggest that this interpretation of competences in the context of teacher training introduces two distinctive elements. These elements are:

> '(a) the necessity for competences to be actively, consciously taught and learned.
>
> (b) the presentation of selected lists of competences whose focus is on the acquisition of 'skills' rather than on understandings or strategies.'
>
> (Moore 2007:126)

However, teacher training is more problematic than this process would imply. A trainee teacher may meet all the competencies but, as suggested by Moore (1996), still have difficulties in the classroom. This may be because during the training course a student can demonstrate meeting the Standards in a particular context at a particular time; it does not necessarily mean that they will be able to meet the Standards in a different context or at a different time. Nevertheless, it is the responsibility of ITT Providers to ensure that all trainees met these Standards, which are explained as defining 'the minimum level of practice expected of trainees and teachers from the point of being awarded QTS' (DfE 2013:2), and that 'Providers of initial teacher training (ITT) should assess trainees against

the standards in a way that is consistent with what could reasonably be expected of a trainee teacher prior to the award of QTS' (DfE 2012:2).

Running in parallel to the discourse on competencies is the discourse on reflection and the development of the trainee teacher as a reflective practitioner, (see section 2.7). The Standards make reference to reflection and the requirement of teachers to be reflective practitioners. For instance, in the 2007 Standards, which applied at the time of the current research study, trainee teachers were required to 'reflect on and improve their practice' (TDA 2007:6) and in the latest edition of the Standards 'reflect systematically on the effectiveness of lessons and approaches to teaching' (DfE 2012:8) and 'guide pupils to reflect on the progress they have made and their emerging needs' (DfE 2012:7) inferring that trainee teachers will have a clear understanding of how to reflect in order to teach pupils how to reflect. Therefore course designers have two distinct areas of teacher training to consider when structuring a course to demonstrate the professionalism of those they train. Firstly, they need to ensure that trainee teachers meet the competency Standards, and secondly support the development of reflective practitioners. These elements appear to be incompatible reflecting different paradigms from two different theoretical foundations. Standards anticipate the collection of evidence to demonstrate that the Standard is met. This is a process that has an end point when it can be considered as complete with a measurable outcome of a having met the Standard or not, this could be described as an inventory (Moore 2007). This suggests a collection of artefacts or products as a record of the trainee teachers' experiences. As noted above, this approach is closely aligned to a behaviourist approach (Furlong *et al* 2000). However, reflection or reflective thought is a dynamic iterative on-going process when the individual works towards solving a problem. Reflective thinking is not necessarily concerned with the acquisition of skills or knowledge, but on improving the quality and effectiveness of

practice in promoting pupil progress. This notion of learning is not about the collection of artefacts but an intrapersonal process which, nevertheless can be shared by externalising thought. As discussed later in this chapter, with a course designed to allow feedback and dialogue with another, then reflective thinking (underpinned by a social constructivist theory of learning) can be supported by the tutor. Hackett believes that competencies and reflection can be incorporated into the same course and may be complementary. It is his view that they can both be employed in training and, if achieved, will allow connections between 'apparently disparate activities' (2001:111). In doing so Hackett (2001) suggests that professional practice will be enhanced. As a result of the inclusion of these two apparently conflicting elements in teacher training, namely competency Standards and reflection, it is the responsibility of course designers when conceptualising the programme of study to ensure that both are clearly defined and well understood to achieve, what Hackett (2001) suggests, is a distinct possibility of harnessing the strength of complementarity that will enrich the training process. On the course researched, this was the function of the e-portfolio.

Teachers and technology

Teachers working within the United Kingdom have, since the late 1990's, been provided with opportunities for training to improve their knowledge and skills in the use of technology in order to integrate this technology in education. From 1999 to 2003 this training was offered through the New Opportunities Fund (NOF) programme with the investment of £230 million (Conlon 2004). NOF training, therefore, offered serving teachers continuing professional development in the use of technologies, however, the impact of this training was evaluated as weak (DfES 2002; Condie, Simpson, Payne & Gray 2002). In 2002 The Office for Standards in Education (Ofsted) stated that the NOF programme had been disappointing with little effect on classroom practice (Ofsted 2002).

However, with the rapidly developing technology that Web 2.0 offers and its integration in the everyday lives of individuals, e-learning is becoming an integral part of the learning process in education (Laurillard 2008; Kress & Pachler 2007) and ITT in the UK (Mee 2008; Boulton & Hramiak 2012). This development has been supported by the Government's e-strategy (DfES 2005). The 2005 strategy introduced a five year plan aimed to address the diverse digital divide that reportedly existed between school children, their parents and teachers by working towards a shared level of understanding and effective use of technology. Taking into account the developments in schools, it is suggested that it is imperative that those training to teach embrace the use of technology whilst they are training in order to be fully equipped to use technology in their teaching (Green & Hannon 2007). One of the ways that teacher trainers ensure that teachers are equipped in this way is by incorporating e-technology into the pedagogy of teacher training.

In ITT, all trainees are required to maintain a professional portfolio of evidence mapped against qualified teacher standards to support their qualification for QTS (TDA 2010). It seems increasingly that this is being achieved with e-portfolios as one of the pedagogical tools (JISC 2008). However, as previously noted research into successful use of e-portfolios beyond their function as a repository has been scanty to date.

2.3 E-Learning in education contextualised

The inclusion of information and communication technologies (ICT), and subsequent government funding in education was a major initiative during the past two decades, and the commitment to develop this further has gathered momentum with the investment in on-line learning (Robertson 2002). The cost of this is hard to determine and finding accurate information with regards to expenditure is problematic. Reported expenditure

varies, for example in 2002 it was estimated at between £30 million to £49.5 million (Twining 2002). Other sources commenting on ICT investment agree that the development of ICT has increased since the early 1980's and, as reported by Thomas (1992), by 1983 cost £30 million. Reynolds, Treharne and Tripp (2003) report an allocation of £900 million to connect schools to the National Grid for Learning[3]. This was from a budget of £1.6 billion set by the new Labour government in 1997 to meet its ICT targets from 1998-2002 (DfEE 1999). This suggests a significant investment has supported schools in the procurement of technology through grant funding, broadband connectivity, software funding, training of all teachers through the New Opportunities Funding (Twining & McCormick 1999), and providing each teacher with a laptop. For example the DfES (2003a) survey revealed that each Primary school in England from 1998 – 2003 had an average expenditure of £11,200. The figure had increased each year from 1998 to 2002 and then decreased in 2003, although it remained above the 2001 level. Secondary schools were investing £91 per pupil per year on ICT, with a government promise of a £1.7 million investment (Green & Hannon 2007). It is through this investment that the government had hoped to achieve its aim of embedding and exploiting technologies, as explained by Charles Clarke the then Minister for Education:

> 'As E-learning has the power to transform the way we learn, and to bring high quality, accessible learning to everyone – so that every learner can achieve his or her full potential'.
>
> (DfES 2003b:2)

Along with the investment came national recognition of integration of technology with a kite mark for schools. The awarding body for this was the National Association of Advisors for Computers in Education (NAACE 2006a), who were supported by the

[3] The National Grid for Learning was a Government-funded gateway to educational resources on the internet.

government to raise standards of ICT in schools by using a self-assessment framework. Primary, Secondary and Special schools were encouraged to work towards the ICT Mark, a recognised award for national accreditation which recognises schools for their 'achievements in their use of technology' and of reaching maturity in embedding technology within all aspects of school life (BECTA 2009a).

The standard of maturity was achieved through schools being able to evidence that they had embedded ICT within all curriculum areas, that it was used to collate information regarding the assessment of pupils and used in the administration procedures as outlined in the NAACE self-review framework (NAACE 2006b). Schools who achieved the acceptable level of maturity by evidencing against this framework were assessed by NAACE, and on successful assessment they were awarded the ICT Mark for a period of three years.

2.3.1 Policy leaders

From the discussion above it seems that Government funding in ICT anticipates that future learners will embrace ICT as an embedded tool in the learning process. Thus there is an implication that future generations of teachers need to be equipped with the skills and knowledge to embrace technology in their teaching practice, actively encouraging the use of ICT across the curriculum (DfES 2003b).

It is largely through the British Educational Communications and Technology Agency (BECTA), the former government's agency leading the national drive for effective and innovative use of technology throughout learning, that the thrust of government initiatives within ICT has come (BECTA 2009b). Through BECTA papers such as 'Harnessing Technology' the government's national e-strategy for learning (DfES 2005) was published. In this publication, schools were actively encouraged to engage with virtual

learning environments, with the target of all schools having a virtual learning environment by 2008. As technology was, and still is, being embedded in school practice there is a need to ensure that all trainee teachers acquire the skills and knowledge in their training period to work within an environment that has ICT embedded in teaching and learning.

Along with the e-strategy mentioned above, other policy bodies include The Higher Education Funding Council for England (HEFCE) and their strategy for e-learning, who together with The Joint Information Systems Committee (JISC) and Higher Education Academy (HEA) carried out an investigation into the use of e-portfolios across different institutions and sectors (HEFCE 2005).

2.3.2 Initial Teacher Training (ITT)

ITT providers, such as universities (where training courses are referred to as ITE) offering undergraduate and postgraduate courses, school-centred ITT (SCITT) and School Direct are responsible for ensuring all trainee teachers have the subject knowledge to teach ICT in the classroom. This is through taught sessions, using technology in their training and in the classroom. Up to April 2012 all trainee teachers were expected to take and pass an ICT test, the purpose of which was described as follows:-

> 'The ICT skills test is intended to ensure that everyone qualifying to teach has a good grounding in the use of ICT in the wider context of their professional role as a teacher.'
>
> (TDA 2012)

This statement anticipates that on successful completion of their training they will be equipped to enter an environment rich with technology. However, Ofsted reported that teachers' subject knowledge in ICT varied and that:

> 'the subject can pose particular problems for teachers because of its technical as well as pedagogical demands.'

(Ofsted 2009:12)

Research has suggested that by using e-portfolios during their training period teachers can gain the skills and understanding of how a learner can use ICT skills which they can transfer to the classroom (Young 2008).

To meet the above and mirror the investment into schools, a parallel drive and investment, although on a significantly lower monetary scale, has been made in the ITT sector. From 2002 an aim of the Training and Development Agency for Schools (TDA), since 2012 known as the Teaching Agency (TA), and since 2013 known as National College for Teaching and Leadership (NCTL), was to raise children's standards, improve teachers' training and development, as well as ensure the supply of good quality newly qualified teachers. From 2002-2007 they funded e-learning projects for teacher training providers, investing approximately £14 million in equipment and research (TDA 2007). To support this aim and to meet the characteristics[4] of the ICT level, providers of ITT were encouraged to bid for grants as follows:

> 'The 2007/08 bidding round also aims to support the 'Characteristics of the ICT level we should be attempting to achieve for all ITT providers' agreed with the Association for Information Technology in Teacher Education (ITTE) and reviewed with other ITT colleagues.'

(TDA 2007:1.3, 1.31)

The characteristics include a consideration that,

> 'E-based support is an integral part of the provider's training programme and all documentation and materials are available online.'

(TDA 2007:1.31)

During 2009-10, the commitment the TDA made to research projects in the use of e-portfolios amounted to £111,200 (BECTA 2010).

[4] 'characteristics' refers to the different strands of the ICT grant

2.3.3 Future investment

The direction of government initiatives and spending in education was changed with the results of the General Election in May 2010 when a coalition government between Conservatives and Liberal Democrats was formed. As a direct result, the existing government department for education was reorganised into a new department with an amended brief. The Department for Education was formed on 12th May, 2010 taking responsibility for education and children's services.

This new government has embarked on a series of changes that reflect and review the focus on educational reform within a policy of financial restraint on public services. After its election it announced a package of public sector savings which included the closure of BECTA with a £80 million budget employing 250 members of staff (Selwyn 2011). The future of ICT in schools is not clear as it seemed to be previously as schools await the publication of the revised National Curriculum[5] (due to be implemented September 2014) and clarification of funding to maintain e-learning. This is complicated by the creation of Free Schools and Academies which do not have to follow the National Curriculum, or, for that matter, employ qualified teachers. The coalition government's views on technology in mainstream schools are seen by some as a lack of interest with 'sustained withdrawal of state support for digital technology use in schools' (Selwyn 2011:407). This may be due to the non-viability of the continued funding stream in the current economic climate (Thompson 2011). An indication of the new landscape for the teaching profession is implied within the new Teachers Standards (2012) where no reference is made to teachers' competence in using ICT as in previous years, removal of the

[5] A nationwide curriculum for primary and secondary state schools outlining the subjects to be taught and the knowledge, skills and understanding required to each subject

requirement for trainee teachers to pass an ICT skills test and the removal of the duty on schools to teach the National Curriculum ICT programme of study for primary aged children. This does not mean that schools do not need to teach ICT, but are free to design their own teaching programme. The draft revised National Curriculum to be introduced September 2014 does not use the term ICT but calls this programme of study 'Computing'. Together these facts appear to presume that teachers have the skills and are able to use these skills in their teaching (DfE 2012).

2.4 E-portfolios defined

E-portfolios are purposeful collections of digital artefacts stored on a web-based facility by the user (Sutherland & Powell 2007). The artefacts can be a simple collection of documents which record the user's reflections and development (Beetham 2005; Barrett 2006). Content may include coursework, assessments, pieces of work relating to life-long learning, reflections on achievements, goals, outcomes, transcripts, records of achievement, evidence of competencies, planning and reflection as well as self and peer feedback (Beetham 2005; Stefani, Mason, Pegler 2007). The e-portfolio has been interpreted as:

> 'The product, related by the learner, a collection of digital artefacts articulating experiences, achievements and learning.'
>
> (JISC 2008)

However, as in the current study e-portfolios may also serve a further purpose beyond simply a repository. They may also be one element of a support structure that is designed to promote reflective thinking. For example, Zubizarreta describes the portfolio as a means:

> 'To improve student learning by providing a structure for students to reflect systematically over time on the learning process and to develop aptitudes, skills and habits that come from critical reflection.'
>
> (Zubizarreta 2004:15)

2.5 E-portfolios and theories of learning

The theory of learning underpinning the use of e-portfolios as a pedagogical tool to support reflective thinking needs to be understood by all who use the e-portfolio, both students and tutors. This will influence the pedagogical approach to be applied. Without a clear understanding by both tutor and learner there may be a clash of paradigms and, consequently, of practices. Research by Gaitan, Manton, and Janowska highlighted the benefits of e-portfolios but questioned the functionality of the system and stated clearly that the success on working in this way depended on 'sound pedagogical principles that relate the portfolios to the learning that takes place in the curriculum' (Gaitan, Manton & Jankowska 2007:33).

2.5.1. Social constructivism

The use of e-portfolios as a reflective tool is based on the theory of constructivist learning (Paulson & Paulson 1998; Bangart 2004; Wong, Clarke, Lodge & Shephard 2007; Stefani *et al* 2007; Buzzetto-More 2010; Gallagher 2001). This suggests that they are part of a learning environment where the learner constructs knowledge, a place where students are actively engaged in the learning process. As commented on by Duffy and Cunningham, constructivist approaches should be viewed as, 'an active process of constructing rather than acquiring knowledge' (Duffy & Cunningham 1996:171).

It is a process where students actively construct meaning through their experience, constructivism being the 'how' of the way in which self-directed learning is achieved (Hafler 2011:47). Wang (2007) found that the introduction of an e-portfolio enabled students to alter their learning style from passive acceptance of information to a position where they were active in the development of their learning. It was through the interactions they had with the e-portfolio that encouraged them to be active and

independent learners constructing their own learning. As experience changes through support from a more informed other, the knowledge is modified. This infers that the learning that takes place is social, as commented by Wilkerson and Irby referring to adult learners:

> '...major sources of learning include socialising experiences, role models that new members seek to emulate, collaborative learning with peers, and direct engagement with the beliefs, roles, power, and culture of the learning environment.'
>
> (Wilkerson & Irby 1998:389)

Therefore e-portfolios designed with the ability to interact with others imply a socio-cultural, social constructivist theory of learning underpinning the learning. This design of e-portfolio allows the user to 'talk' via text to another user and vice versa. This mirrors the habits of many students who routinely converse through social media sites as a means of social interacting, with ninety-five per cent of these students reporting regularly using social networking sites (Madge, Meek, Wellens & Hooley 2009).

Vygotsky (1978) developed the socio-cultural theory of learning and believed that the latter is mediated by the social and cultural environment, and explored the collaborative nature of building knowledge. One of Vygotsky's main points in his theoretical work was the encouragement of talk as a means of refining the learning that is taking place. He documented that it was the articulation of thought and the discussion with another person that helped to refine the learning taking place (Kozulin, Gindis, Ageyev & Miller 2007). Social constructivist theories have some commonality with other forms of constructivism, sharing the common view of the way in which learners construct their knowledge with, 'A clear focus on the context of the professional situations and learning communities' (Hafler 2011:55).

Vygotsky emphasised the importance of culture and language on human development, conceptualised development as the construction of learning that takes place in a shared

social context leading to internalised process, and put forward the notion that higher level learning can be achieved when supported by a more informed other in a social context, leading to individual expertise (Kozulin *et al* 2007).

In an adult educational setting, the more informed other may be a peer who has more knowledge or the tutor, books or computers. Vygotsky (1978) called the potential developmental progress from what one can do unaided, and what one can achieve when supported by the more informed other, the 'zone of proximal development' (ZPD). He defined the ZPD as:

> '…the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers.'
>
> (Vygotsky 1978:86)

He saw learning as a process carried out in collaboration with others suggesting that individual consciousness is built through relations with others, and that we become aware through our interactions. Our response to these external interactions is dependent on how we interpret this consciousness.

The social constructivist view of learning has since been developed by others who have explored further the social aspect of learning. Bruner (1985), for example, referred to the support for learning from a more informed other as 'scaffolding' and the importance of the child as an active learner with the teacher carrying out the process which the student cannot yet do for him/herself. He developed the notion of a spiral curriculum where the child developed through learning opportunities to acquire greater experience.

Constructivist education is based on the principle of the learner constructing meaning through the successive iteration of the knowledge acquisition process, in the attainment of knowledge that increases in depth and complexity. Socio-constructivism implies that this

learning will be carried out in collaboration with others often with language as the mediator. E-portfolios designed with activities that enable asynchronous support by feedback can be described as having socio-cultural, social constructivism underpinning the learning due to the collaborative nature of the possibility of interaction, through written language (Bates 2005).

Underpinning theory

Teachers in the role of the more informed other and learners, all need to be clear about the theory that underpins the learning taking place in order to understand how the learning outcomes are to be achieved. It is the distinction and the interpretation of the theory by users that need to be clearly understood and may impact on its success in the long term (Roberts, Aalderink, Cook, Feijen, Harvey, Lee & Wade 2005). This view is shared by Tosh *et al* (2005) who believe the learning outcomes using an e-portfolio need to be identified for clarity of understanding by the provider and user. The implication is that the successful implementation of an e-portfolio in an educational setting hinges on the understanding of the theory of learning that is underpinning the process. This is also the case when considering the pedagogical implication of a theory of learning, and how this is applied to the learning process in practice (see 2.5). Mayes and de Freitas (2007) conclude that when designing technology for learning there is a need to adopt a theory of learning and with this the necessity to understand the pedagogy to be applied to that theory. Biggs (1999) explores this in detail suggesting that decisions made at the design stage are less complicated if the constructivist pedagogical approach is adopted.

Existing research about the use of e-portfolios tends to focus on the pragmatics of the compilation of the repository, assessment and the end product. What is largely missing is findings and further research into the use as a pedagogical tool to support learning,

reflection and the development of understanding from an assumption of the learner as having an active agency in learning, and learning itself as socially constructed.

2.6 Pedagogy

The definition of pedagogy that is adopted in this study follows that of Pollard (2010):

> 'The practice of teaching framed and informed by a shared and structured body of knowledge. This knowledge comprises experience, evidence, understanding, moral purpose and shared transparent views.'
>
> (Pollard 2010:5)

Pedagogy has been defined as the art or craft of teaching (Schön 1983), however, writers such as Smith (2012) suggest that this concept needs to be viewed as the thinking and practice of educators who accompany learners and bring learning into life. This implies that teaching is one aspect of tutors' practice. Smith discusses three areas for bringing learning to life - animation, reflection and action. Animation is defined as bringing new experiences, reflection as creating opportunities and action by working with people to make changes in their lives.

As noted already, if e-portfolios are to be successful, tutors need to understand the implication of the underlying pedagogical principles which are ultimately derived from the view of learning as well as the expected outcomes. For instance, journal writing on an e-portfolio can be for the students' internal dialogue and the development of personal reflection, which would need a different design and pedagogy to that for a journal written for assessment purposes, for an audience, which is qualitatively different (Bolton 2012). If social constructivism is adopted as the underpinning theory of learning, then the pedagogical approaches to support students as active agents in learning is assumed. Likewise social constructivism implies that the pedagogical approach will support learning in a social context. This would indicate that the pedagogy adopted allows the learner, the student, flexibility to construct this learning within a framework that supports

and encourages individuality of thought. As stated by Kimball (2005) good portfolio pedagogy:

> '...seeks to encourage students to become dynamic participants in their own learning .... students are not merely the users of the system; they are, or should be, the authors of it.'
>
> (Kimball 2005:442)

It is the pedagogical framework that allows the tutors to provide an environment for learning, designed to shape students' ways of thinking about the learning taking place (Mayes 2006). The difference between tutor-centred and student-centred pedagogy is defined by Goodyear (2002) as the learning opportunities provided on an e-portfolio. Tutor-centred pedagogy requires the completion of tasks designed and set by tutors, predominantly for the transmission of knowledge view. Student-centred pedagogy, as in the current study, means the completion of activities which encourages students to take responsibility for the development of their knowledge through the social interaction with the more informed other. The first provides a tight framework of outcomes, the second by its very nature gives the student the flexibility to approach, compile and complete the activity (Goodyear 2002). By adopting an activity approach, as discussed above, the pedagogy becomes student-centred where the emphasis is on learners regulating their own learning (Mayes 2006). However, as Zubizarreta (2006) argues, this is successful when used in three domains of activity, these being documentation, reflection and collaboration and that the act of reflection is best achieved by not leaving students on their own in thinking about learning, but by exploiting the advantages of collaboration. The learner-centred approach allows the student to learn through the construction of the e-portfolio, the process of which includes collaboration and feedback from the tutors (Lynch & Purnawarman 2004). Those with learner-centred beliefs tend to see more positive values of the use of the e-portfolio to encourage students to monitor their

learning growth as well as increasing the use of multimedia (Cho & Brown 2007). It is accepted that teachers' belief will ultimately shape the pedagogy that is associated with the effective use of technology. Webb and Cox conclude that only those teachers who develop students as autonomous learners achieve the pedagogical practices associated with the effective use of technology, and that the process of changing a teachers' pedagogical practice is '...likely to be a very difficult and complex process' (Webb & Cox 2004:278).

Students training on a course involving online learning and workplace situations, such as ITT courses, acquire the knowledge to construct their e-portfolio from the different areas of their training – university and placement underpinned by their own prior experience and personal philosophy of being a learner in the educational system. One of the strengths of using e-portfolios on ITT courses is that they can be seen as a mechanism for students to understand their professional growth, making the link between university and teaching practice, that is the essence of an experiential approach to learning (Fiedler, Mullen & Finnegan 2009). The experiential learning experience that occurs whilst on placement is achieved by engaging learners in a real learning experience which supports this pedagogy. However, there is very little information about the use of e-portfolios whilst on placement to evaluate the effectiveness in supporting the development of reflective thinking (Duffy, Anthony & Vickers 2008). As Nixon, Smith, Stafford and Camm, explain:

> 'Acquisition of meta-cognition – learning to learn – alongside new knowledge and technical knowledge is one of the defining features of work based learning. That is, the pedagogy is experiential in nature.'
>
> (Nixon *et al* 2006:29)

In addition, students also need to know how to engage with the online element of the course, the e-portfolio, in order to derive the best possible benefit from using this

technology. They need to understand the pedagogy being adopted in order to mirror the way of working that this pedagogy supports, as it is through their reflection on e-portfolios that they make meaning out of the diverse and often unconnected pieces of information (Cambridge & Cambridge 2003). It is the e-portfolio's support of reflective thinking that, according to BECTA (2007), is its most defining pedagogical feature. Failure to acknowledge and employ the pedagogy that needs to be employed to support the development of the construction of learning may result in a clash between the expectations of the tutors and the expectations of the students. There are also issues related to pedagogy versus pragmatics, invariably causing tension between the ideal and the manageable (Cambridge 2010). One dichotomy is students attempting to achieve these aims whilst working with technology that is often driven by the university, where it achieves high status, and in individual schools where students may encounter a lack of interest by many teachers who do not necessarily have an incentive to engage (Bates 2005). Another dichotomy is students being asked to write reflections based on their experience and reading of literature whilst being assessed using criteria that may influence the way in which the reflections are written (see section 2.7).

The adoption of an e-portfolio in ITT with the aim of supporting a multi contextual-based course should be considered in course design and applied pedagogy. Both students and tutors will need to have the skills to operate in this environment. As Bates (2005) points out, web-based learning does, by its definition, require the user to have a wide range of different skills and few people are likely to meet the standard required on all these skills. He also explains that in designing a course with the associated pedagogy the course designers must address the question of what is it students need to learn, as this is crucial. This implies that the pedagogy should put the spotlight on the learning taking place not

the technology used to support that learning. As the finding from the research carried out by Barrett clearly states:

> 'This finding validates the assumption that content and reflection on learning is more important than technology in implementing electronic portfolios. The focus should not be on the technology, but on the learning.'
>
> (Barrett 2007:447)

This is further explored by Bates (2005) who suggests that the pedagogy adopted should take into consideration both the content that is required and the skills needed in accessing learning and that there is as clear, 'distinction between content and skills' (Bates 2005:56).

This view is supported by Laurillard and Masterman (2010), who argue against a technology-driven approach often adopted at the expense of education-driven use of digital technologies. Part of the pedagogy adopted must support the asynchronous access to materials and support from the tutor. This puts the emphasis on access to suit the requirements of the learner, not the university or the tutor (Felce & Purnell 2010). Early outcomes from their action research first pilot indicate the following for pedagogical design:

> 'A scaffolded e-portfolio can provide a learning medium for work-based learners. An e-portfolio can allow work-based learners to build their learning into a coherent award. Ensure you provide clear guidance and support for developers and learners. Make use of the existing intellectual capital to build capacity and the community of practice.'
>
> (Felce & Purnell 2010:5)

In the theory of social constructivism students use the e-portfolio to support their learning. The relationship between the tutor and the student is crucial in supporting that learning. The tutor is taking the role of the more informed other, the student reflecting on his/her learning, the tutor giving feedback on the reflections, with the student using that feedback in order to scaffold future learning. This is the purpose of the e-portfolio within

this study, the student exposing his/her thinking so in discussion with someone else they can construct their learning. E-portfolios enable learners to scaffold their own learning because they provide the means to externalise thinking and therefore present the opportunity to not only share this externalised thought with the more informed other, but also to reflect on the externalisation as a means of developing thinking.

In summary, tutors who adopt a socio-cultural understanding of learning in conjunction with their pedagogical approach are far more likely to be able to integrate ICT into their teaching. A view of learning as the transmission of knowledge can be seen as a teacher-centred approach, whereas if tutors see themselves as a facilitator of learning then it may be considered to be a student-centred approach adopting a constructivist theory to learning (Lindblom-Ylänne, Trigwell, Nevgo & Ashwin 2007). As suggested by Drent and Meellisson, if tutors reflect on the quality of their education,

> 'Teacher educators are stimulated to develop a more student-oriented pedagogical approach and the matching use of ICT. Consequently, innovative use of ICT is partly the result of a teacher's conscious choice to integrate ICT into their (more student oriented) education.'
>
> (Drent & Meellisson 2007:195)

2.7 Reflection

It was important to investigate the literature regarding reflection and assessed reflection, to understand the role of reflection in the construction of new understanding. Reflective thinking, which is closely related to socio-cultural understandings of learning, is acknowledged as an essential element of the professional development of trainee teachers (Cohen, Manion, & Morrison 1999; Moon 2005; Pollard, Collins, Maddock, Simco, Swaffield, Warin & Warnick 2005; Luttenberg 2005). Janssen, Hullen, and Tigerlaas (2008) express reflection as, 'A mainstay of teaching and an essential element is problem-solving.' (Jansesen *et al* 2008:115).

Reflection can be defined as a way of learning and developing (Bolton 2012, Moon 1999), a way of finding the subjective voice leading to inner learning (Pavlovich, Collins & Jones 2009), and to encourage interaction with the content rather than focusing on what the content is (Varner & Peck 2003). Through reflection one is able to interpret and understand the meaning of one's own practice (Lyons 2006).

Many definitions of reflection have emerged over the years since Dewey (1933) expressed the opinion that reflection could be defined as problem solving, a chain of linked events and considered the process, making sense of the world. He defined reflective thought as:

> 'Active, persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and further conclusions to which it leads ... it includes a conscious and voluntary effort to establish belief upon a firm basis of evidence and rationality.'
>
> (Dewey 1933:9)

Dewey considered it to be a deliberative cognitive process involving linked ideas that interconnect and take account of the wider context (Francis & Ingram-Starrs 2005). Dewey (1933) implied that the process of reflection is not immediate but takes time to develop, setting this apart from routine action; this is in contrast to Schön's view of reflection in action which may not be a conscious activity. Dewey's explanation of the notion of a community of inquiry suggests that this level of reflection will be enhanced by the questioning of others (Francis 1997). This indicates that reflection is an active and deliberative cognitive process; it takes into consideration many aspects of the individual's experience including one's beliefs and prior knowledge and is influenced by context (Hatton & Smith 1995). In addition, the comments of others in the form of feedback allow the author to consider in more depth their reflections and move them forward in the level of reflection, suggesting reflection to be a hierarchical process (Bain & Mills 2002). Schön (1983, 1987) puts forward the notion of analysing professional practice as a

discrete activity. He considered that the activity of reflection proposed by Dewey (he referred to this as 'technical rationality') did not explain how professionals work and learn through practice, suggesting that:

> 'Real world problems do not come well formed. They tend to present themselves, on the contrary as messy, indeterminate, problematic situations.'
>
> (Schön 1983:68)

Schön (1983, 1987) considered reflection within the professional activity of the application of professional knowledge and its development. He made the distinction between reflection on action (after the event, a process of reviewing), and reflection in action (active thought). Writers such as Eraut (1994) have expressed doubts about the existence of reflection during action. However, Schön argued that the positioning of theory within practice is driven by reflection, and this is how one acquires expertise. Moon (1999) suggests that the difference between Dewey and Schön lies within their point of focus:

> '...holistic or specific, professional or personal, and that our adoption of any reflective model may be shaped by our underlying reason for using it – our processes, our goals and even our methods of assessment.'
>
> (Moon 2001:4)

Many attempts have been made at defining reflection as a result of research into this activity, synthesising the views of Dewey (1933), Juch (1983) and Kolb (1984) on experiential learning cycles, Schön on reflection in a professional capacity as reflection on action, in action (1987) and Mezirow's work on perspective transformation (1981), for example:-

> 'Reflective engagement involves a deliberate and intentional act of interrupting, or suspending, one' teaching practices to interrogate or inquire into them systematically and to heighten one's conscious awareness of one's practices and of one's students and the using that consciousness to redirect one's practices and of one's students and then using that consciousness to redirect one's practices and actually acting to change.'

(Lyons 2006:166)

> 'A generic term for those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to a new understanding and appreciation.'

(Boud, Keogh & Walker 1985:19)

> '….a simple activity, a development of thinking that has associated with it a framework of different inputs, contexts and purposes that cause confusion for those who study it.'

(Moon 1999:22)

> 'Reflection is the process of engaging with learning and/or professional practice that provides an opportunity to critically analyse and evaluate that learning or practice. The purpose is to develop professional knowledge, understanding and practice that incorporates a deeper form of learning which is transformational in nature and is empowering, enlightening and ultimately emancipatory.'

(Black & Plowright 2010:246)

Habermas (1971) focused on how humans process ideas and construct them as knowledge. He discussed three kinds of knowledge, instrumental knowledge functioning within an environment, knowledge concerned with the interpretation of human action or behaviour and finally knowledge acting on the first two forms. Unlike Dewey who considered the importance of the process of reflection, Habermas believed that the place of the process of reflection to be significant. By emphasising the importance of the place of the process and the significance of content, he linked the process of reflection with ideals of empowerment and pursuit of the truth. Habermas put forward the notion that reflection is hierarchical and that knowledge is developed by interpretive means before a critical overview. In discussing the importance of language, Habermas suggests this happens in three worlds - the world of external nature, our world of society and 'my world' of internal nature. This is explained by Roderick as:

> 'The world of existing states of affairs, the world of normatively regulated social relations and the inner world of the individual's intentional experiences.'

(Roderick 1986:96)

It is by reflecting in this wider content that, according to Luttenberg determines the 'breadth of the reflection' (2008:544). This view is endorsed by Francis and Ingram-Starrs who go on to stress the difficulties encountered:

> '...critical reflection is both a political act and an emotional behaviour. We argue that critical reflection is not something that is easily learned; it is indeed 'a labour'; strenuous activity that involves difficulty and persistent effort which usually affords not pleasure in early stages.'
>
> (Francis & Ingram-Starrs 2005:543)

A framework of hierarchical reflection developed from some aspects of Habermas has since been used by writers such as Hatton and Smith (1995) and Moon (2001).

Hatton and Smith, working in an Australian context, sought to investigate the nature of reflection and strategies to assist reflection, with the intention of identifying specific forms of reflection for use in teacher education. Hatton and Smith defined reflection as '...deliberate thinking about action with a view to its improvement' (Hatton & Smith 1995:40). This is the definition of reflection that most closely fits the focus of the current research study.

Hatton and Smith (1995) stated that reflection is an active and deliberative cognitive process influenced by context, taking into consideration the individual's experience, beliefs and prior knowledge and it is possible to create learning activities to develop reflective approaches. They identified three distinctive forms of reflection as a developmental sequence leading on from purely descriptive to descriptive reflection, dialogic and critical acknowledging that dialogic and critical take time to develop, need prior knowledge and an experiential context in order to achieve and occurrences of critical reflection were superficial and only occur briefly. By applying criteria for different types of reflective activity it implies that writing should be constructed in a certain form, written in a particular genre and that journal writing offers more

opportunities for reflection than essay writing but there are issues of writing to accommodate the expectations of the reader.

Reflective practitioners

In the research site, all trainee teachers were required during their training year (pre September 2012) to show evidence against the QTS Standards[6]. Standard Q7(a), for trainees training under the 2011 Standards as follows:

> 'Reflect on and improve their practice, and take responsibility for identifying and meeting their developing professional needs', and Q28 'Support and guide learners to reflect on their learning, identify the progress they have made and identify their emerging learning needs.'
>
> (TDA 2010)

and Standard 4 of the Teachers' Standards for those training after September 2012, '...reflect systematically on the effectiveness of lessons and approaches to teaching' (DfE 2012).

It is by meeting these Standards that they show, according to the Teaching Agency (previously TDA), that they are able to make improvements in teaching and learning leading to development as a reflective practitioner. The term reflective practitioner is used to describe not only the acquisition of skills and knowledge but more importantly:

> 'The particular skills needed to reflect constructively upon ongoing experiences as a way of developing those skills and knowledge and improving the effectiveness of one's work.'
>
> (Moore 2000:128)

One of the key aims of the e-portfolio is, therefore, to help support and promote reflective approaches to evidencing the attainment of programme outcomes (Cotterill, McDonald,

[6] All trainee teachers in England are required to compile a portfolio of evidence to show they have met the Teachers' Standards. Prior to September 2012 all trainee teachers were expected to provide evidence for thirty-three Standards, this set of Standards were revised with the introduction of a new framework of eight standards from September 2012.

Drummond, Hammond 2004). Reflection has, therefore, been advocated as a tool by which teachers, both in training and when perfecting the skill of teaching, can make sense of and understand their teaching (Marcos, Sanches & Tillema 2007, Children's Services and Skills 2010). This is explored in a House of Commons report where it is stated 'Teaching needs to be a learning profession. A vital aspect of this is teachers reflecting on their own practice and supporting colleagues'. They suggest this will be achieved by 'good quality mentoring for trainee teachers, and newly qualified teachers' (Children's Services and Skills 2010:33). It is achieved in the training period but also encouraged throughout the career of a teacher, where continuing professional development is seen as a lifelong process (Musset 2010: Villegas-Reimers 2003). It is through this experiential learning cycle, such as that proposed by Kolb (1984), that professionals develop. He considered that reflection is a cognitive process, learning from experience through four stages – concrete experience, reflective observation, abstract conceptualisation and active experimentation. This is not without its critics such as Moon (2001) who suggests it has more to do with the management of learning of others. The Kolb (1984) cycle is similar to the cycle adopted with e-portfolios, that of orientation, selection, reflection, representation. As explained:

> 'When a learner engages with an e-portfolio they do so with an orientation. The orientation will determine the selection of artefacts to be included in the portfolio. Having selected artefacts into the system and reflected upon them, the learner then selects them out of the system, that is, they make a presentation using a subset of the artefacts.'
>
> (Roberts *et al* 2005)

However, students may not be able to achieve the level of reflection due to them being self-centred, not able to move beyond the descriptive level, or overwhelmed by the multifaceted nature of the process of reflection (Korthagen 1999; Spilkova 2001; Richert 1992). It is their understanding of the multifaceted nature of reflection that is crucial to

the impact of reflection on their learning. It is argued by Francis and Ingram-Starrs (2005) that the level of critical reflection required by teachers is not something that individuals can easily learn due to the complex nature of the process and the effort required leading to negative results in the early stages. Due to the novice nature of trainee teachers and the inexperience of knowing how to implement a strategic change, or for that matter know what the strategic change may be, the very act of reflection can be extremely difficult due to their limited repertoire of knowledge (MacKinnon & Erickson 1988). Also the result of the reflection is a consequence; this consequence may or may not lead to action (Grimmett & Erickson 1988). However, the act of reflection encourages students to engage in meta-cognition and develop their own philosophies in relation to their experiences, although without an end product it is difficult to assess (Avraamidou & Zembal-Saul 2003). Those trainee teachers on placement could be described as involved in the process of action research, as teaching practice has been linked to this form of research (Pollard 2002, Reason & Bradbury 2001), but it is the subsequent reaction to the reflection which ultimately categorises the process as reflective thought described by Dewey (1933). Reflection using e-portfolios is, by the nature of the process, an individual personal activity carried out in isolation from others in the initial instance. The resulting reflective journal may be shared with the more informed other, however, the very act of reflection is not initially a collaboration of ideas until it is shared and feedback is received. It is assumed in the theory of social constructivism that it is from the feedback they receive that students will construct learning and this will inform future reflection. This is described as an effective strategy to adopt during the training period (Bain & Mills 2002). Reflection underpinned by social constructivism needs to be viewed as an organic process, developing over a period of time. However, for this to be successful then the student and the tutor have to overcome the issues discussed later in

this section. It is from feedback that trainees will learn how to move from a level of reporting what has happened, for instance focusing on an action that they have the ability to change such as matters relating to the theory of classroom management, to analysing the learning that is taking place and how they will move this forward (Russell & Mundy 1992). The consequence of providing this feedback is that tutors will need to invest considerable time in providing individual feedback to the trainees. To achieve this level of personalised learning is not a simple or speedy activity and will impact dramatically on the time of the tutor involved (JISC 2008). If trainees do not receive feedback then they may feel that their work on reflection is not a valued activity. This is just one of the 'roadblocks' that individuals may encounter during the training period (Freiberg & Waxman 1990). It could be argued that this is a valuable experience as it mirrors what they will encounter in their life as a teacher where reflection is often achieved working in isolation. This is when they will encounter the act of teacher reflection, sometimes referred to as 'working towards a practical solution' due to the way in which it is used to inform future actions and not necessarily in a cyclical way, in order to scrutinize their actions (Marcos *et al* 2008:108). This notion of working alone on a solution does not necessarily reflect the nature of schools as communities of learning and the social interaction encouraged and fostered in the classroom as a strategy for problem solving. It appears for the experienced teacher to be an act of individual complex enquiry leading to a consequence, far removed from the notion of a community of inquiry (Dewey 1933, cited in Francis 1997:171). However, it is fundamental to the social constructivist theory of learning that, through questioning by others, the necessity of social interaction, that improvement in reflection will be achieved.

It is through this social interaction and dialogue that individuals learn how to see the situation from multiple perspectives (Valli 1990). By considering the perspectives of

others, they will be in a position where synthesis of different views will be possible. It is also through this type of discussion that trainees may feel threatened by the exposure of their values and beliefs; it is the act of divulging their thoughts in an open forum that may lead to feelings of vulnerability and prevent a trainee from fully engaging in the activity. In this process of learning that trainees learn how to act when they do not fully understand what it is they are supposed to do (Grimmett & Erickson 1988). For trainee teachers learning how to become reflective practitioners this is often the course the learning must take, taking the theoretical background, and practising the skill in order to perfect the craft.

> 'The paradox of learning a really new competence is this: that a student cannot at first understand what he needs to learn, can only learn it by educating himself through self-discovery, and can only educate himself by beginning to do what he does not yet understand.'
>
> (Schön 1987 cited by Grimmett & Erickson 1988:10)

Assessed reflection

ITT courses often turn to the use of e-portfolios in the process of assessment as a way of measuring the extent to which students have achieved standards (Strudler & Wetzel 2005). However, as discussed by Hicks, Russo, Autrey, Gardner, Kabodian and Edington the increasing focus to use e-portfolios as an assessment tool is worrying. They consider the focus should be on 'rich, contextual technology learning and reflection' (2007:451). With assessed reflection there are important issues of purpose, inexperience of trainee teachers working in different contexts, objectivity in marking reflection, and how reflection can be improved. It raises the question of whether reflection is hierarchical in that it improves as the course progresses, or is linear with the trainee moving forward and backward along a continuum according to level of engagement in the subject being reflected upon. This suggests that teachers may reflect in a different way at different times of their practice (Leitch & Day 2000). However, Taber (2008) suggests that

assessed reflection can be a valuable record of critical reflection. There is also the question of who assesses the reflection and how this is assessed. In this research assessment was carried out by tutors, although, Hagger and McIntyre (2006) and Ashby, Hobson, Tracey, Malderez, Tomlinson, Roper, Chambers and Healy (2008) suggest that it is the classroom practitioners who are based placed to support trainee teachers to become reflective.

Purpose of assessed reflection

The use of e-portfolios in ITT for assessed reflection is complex and problematic with a need to measure attainment when trying to encourage critical reflection. Strudler and Wetzel (2012) suggest factors for student-centered learning such as choice, feedback, reflections on practical experiences that may conflict with factors that work best for gathering data and accreditation, such as a prescriptive structure. The result of this may encourage trainee teachers to write within a framework prescribed by tutors who mark the work according to the marking criteria rather than reflect freely their experiences. When reflection is shared in either an academic or professional environment there are issues of the honesty of reflection, attempting to please those who are perceived to be in power, when views may be open to challenge (Hargreaves 2004). It is considered by some writers that journals will not be successful if students are to be assessed because they are writing them with the knowledge that they will be judged by another, as the marker is seen as in a position of power (Creme 2005).

Context

There is also the influence that the context may have on the nature and quality of reflection due to the experience the trainee is exposed to in the setting (Carney 2002).

This may lead to students writing strategically (Pecheone *et al* 2005) or in some circumstances fictional writing with no real meaning (Hobbs 2007).

Objectivity in marking

Reflection on one's own practice can be seen as the externalisation of internal dialogue primarily for the author, and can encourage deep critical reflexivity if the process is managed well (Bolton 2012). This raises a question of how an individual's writing of subjective experiences can be objectively marked by tutors, the realisation which may lead to students not revealing their true reflections, but writing to marking criteria (Sutton, Townsend &Wright 2007) as implied already. It is also a question of how unbiased the marking of an assessed reflection may be when the assessor's theories differ from those of the writer (Hartmann & Calandra 2007). This has also been found to be an issue in various professions such as nursing (McMullan, Endacott, Gray, Jasper, Miller & Webb 2003). Therefore, as Pavolovich *et al* (2009) suggest, it is the challenge of all tutors to provide guidelines with regards to expectations whilst retaining the student's ability to remain in control of the revelations, putting them at the centre of the process.

The process of improving students' reflection

The assessment process could be seen as necessary to motivate the student to complete reflection because, without the grading of work, the students will not, necessarily, put in the required effort (Kennison & Misselwitz 2002). This may add rigour to ensure trainee teachers are challenging themselves to move beyond technical reporting, and not purely describing an experience (Dymoke & Harrison 2008). However, Gomaz (2000) suggests that describing an experience is what trainee teachers do when asked to reflect on a classroom experience, because the activity is non-challenging and also does not require them to take risks. The implication is that the experiences the students are exposed to are

not sufficiently challenging to enable depth of reflection. As the art of teaching is an extremely complex and sophisticated process, trainee teachers need to be guided to not only evaluate their individual teaching of lessons, but to move towards developing themselves as teachers (Black & Plowright 2010). In addition, if this is accepted as a truism, it may be that students do not reflect naturally but need to be taught the skill (Kathpalia & Heath 2008), and that novice teachers do not have the ability to reflect on practice where they are effectively borrowing the routines of others (Hobbs 2007), then it appears that some degree of assessment with feedback is required for learners to acquire the necessary skills in order to reflect. This is how the knowledge and understanding of multiple perspectives may be achieved (Alterio 2004) and how trainee teachers progress from the reflection of their own practice and that of others (Boulton & Hramiak 2012). It is also proposed that students are more likely to act on feedback given through the reflective journal than they would if comments were received on other assignments (Kathpalian & Heath 2008).

2.8 Initial Teacher Training and e-portfolios

The aim of training is that trainee teachers learn how to teach to Standards defined by the Teaching Agency[7] (TA) to reach Qualified Teacher Status (QTS). These Standards define the areas of competence but it is the Office for Standards in Education which has defined the levels of competence (Ofsted 2012).

As previously stated the development of e-learning, and in particular the use of e-portfolios in ITT is widespread (Mee 2008). It is through using the technology during their training period that teachers can gain the skills and understanding of how a learner

[7] The Teaching Agency merged with the National College in on 1st April, 2013 to form an organization called the National College of Teaching and Leadership. The new agency has two key aims: improving the quality of the workforce; and helping schools to help each other to improve.

can use ICT as a tool for self improvement. For instance, ICT can provide the access and control over a valuable body of knowledge and information (Evans & Powell 2007) and by creating e-portfolios trainee teachers develop technology skills, which can be used to support the pupils in the use of technology in the classroom (Young 2008).

With the plethora of e-portfolios being offered for personal, shared or private use and use which may or may not be dependent on the objectives of the provider, their uses vary from establishment to establishment. The commonality is that they are used as a vehicle for offering online storage space for the community they serve. It is the way in which they are used, the pedagogy adopted and the reason for the adoption which makes them a discrete tool in each setting.

2.8.1 Adoption of technology

The use of e-portfolios may support trainee teachers to be confident and competent in using e-technology with which pupils are already familiar. As such, the move towards using an e-portfolio as opposed to a paper-based portfolio has been explained as a process of, 'more authentic effective training of our next generation of teachers' (Evans & Powell 2007:119).

However, as noted already, Roblyer and Knezek (2003) question whether or not students and institutions should use technology more and ask why this is the case. They question the value of e-portfolios in teacher training together with, why teachers should use technologically based methods when traditional methods have served their purpose for many years. The response to this suggestion may well be that with the introduction of new technologies in schools, then those who are being trained to teach this next generation of children need the skills and knowledge do so in an environment rich in technology. This view is endorsed by the findings of research in the way young people

use technology who found the use of digital technology has been completely 'normalised by this generation', and goes on to say that not only is it a normal and accepted part of life, it is also 'fully integrated' into their daily lives (Green & Hannon 2007:10). Therefore, if we are educating children from a digital generation and training teachers who may also be part of this digital generation, the teaching of these children needs to reflect what is relevant in their lives, moving away from directed learning of ICT and more towards facilitation. This is with teachers in the role of the more informed other in the use of technology to support learning. If new teachers are to respond and identify with the digital generation who may have, for instance, daily access to social networking then they need to be trained to use new technologies in innovative ways. If not when entering the classroom this may impact on their confidence levels as teachers in the role of supporting learning (Green & Hannon 2007).

2.8.2 Portfolio of evidence

The use of portfolios is not a new concept and has been used to showcase a person's work in many professions. As noted already, and as suggested for example by Young and Lipczynski (2007) , the use of portfolios to promote learning in the training of teachers is not a new phenomenon; it is the mode of doing so that is new.

All trainee teachers are required at the end of their fixed-time training period and before the award of QTS to provide evidence in a portfolio to show they have sufficient experience to meet the criteria laid down by the NCTL (formally known as TA). The traditional paper-based portfolios have been critiqued by some researchers as clumsy, cumbersome, and lacking transferability (Young 2008). The fundamental idea was that by using an electronic means of data collection these problems would be solved by the 'flexibility inherent in the structure' (Young 2008:3). It is felt the act of maintaining a

portfolio and mapping the contents against externally imposed standards encourages students to become self-regulated learners,that is, learners who are active participants who are able to think critically (Barrett 2007; Zellers & Mudrey 2007).

2.8.3 Use of e-portfolio as a pedagogical tool

As suggested above, the e-portfolio can be used as a pedagogical tool that is part of the process of mediating learning in development towards reflective practice. The intention of the course provider on how the e-portfolio will be used on the course, as set out in the module guidelines, should influence the use of the e-portfolio by the student. It is the interpretation by the user, as well as the intention of the provider, that needs to be clearly understood and may impact on its success in the long term (Roberts *et al* 2005; Tosh *et al* 2005).

The development of e-portfolios itself is a process of evidence collection, processing, reflection and evaluation, in its most simplistic form, that gives the user the opportunity to reflect on individual pieces of work (Barrett 2004). There are two main driving forces for the use of this technology, as a reporting system of assessment and/or the recording of a learning process. There is a clear distinction between an e-portfolio as a learning journey to tell a story, a collection of artefacts as evidence against Standards, and a reporting system of assessment management providing evidence of attainment (Bolton 2012; Cohen 2005; Pecheone *et al* 2005). It is the reason for the adoption of the e-portfolio and the pedagogy adopted that defines the outcome.

2.8.4 Successful implementation in Initial Teacher Training courses

The implementation process of the e-portfolio can ultimately inspire and motivate users in embracing the advantages that this system offers above the conventional paper and pen version. It is the shared vision and purpose that will either persuade the users, whether tutors or students, of the value of using this technology. The key issues discussed in the literature that influence successful implementation are slow implementation (Mason, Pegler & Weller 2004, Kirkwood 2009), prior experience (Strudler & Wetzel 2005; Gathercoal, Love, Bryde, & McKean 2002), purpose and/or different purposes (Cotterill *et al* 2004b; Roberts *et al* 2005; Tosh *et al* 2005), technical support, management support (Wray 2007; Cotterill *et al* 2004b), costs (Roblyer & Knezek 2003), technical capability (Young 2008), and training and support for tutors/students (Green & Hannon 2007) as discussed in subsets below.

Slow implementation

The outcome of research suggests slow implementation is vital for the success of integrating an e-portfolio (Mason *et al* 2004; Kirkwood 2009). However, the transition from a paper to a digital system can prove to be problematic and if an institute adopts a slow and gradual implementation process there is a danger of duplication of records. If duplication of records occurs then this can influence the successful implementation of an e-portfolio as the users may feel they have to complete double the work than they would when only using a paper system (Lorenzo & Ittelson 2005). In general, the implementation process for any organisation-led initiative follows four distinct phases as identified by Alexander and Hedberg (1994): design, development, implementation and

institutionalisation or the three phases as highlighted by Fullan when discussing in the process of change in education:

> '...phase I - initiation, mobilization or adoption, phase II implementation or initial use and phase III continuation, incorporation, routinisation or institutionalisation.'
>
> (Fullan 2007:65)

The above generalisation may be applied to the introduction of an e-portfolio as a new initiative following the same process of design, development, implementation and institutionalisation. This implies that an institute needs to implement the e-portfolio with a clear understanding of the purpose and audience as lack of understanding is a key barrier to use (Peacock, Gordon, Murray, Morss & Dunlop 2009). As Schön identified, real change involves 'passing through zones of uncertainty' (1971:12). This is the case whether the change is imposed or voluntary. As Fullan points out, referring to educational change, '...crux of the change is how individuals come to grips with the reality' (Fullan 2007:20).

Prior experience

A common theme that is discussed by Studler and Wetzel (2005) and Gathercoal *et al* (2002) is that familiarity with a paper-based portfolio is one factor that impacts on the successful implementation process. Therefore, if trainees have had experience of portfolios before commencing a course with an e-portfolio then their prior experience will impact on the successful integration on a new course. The inference is that knowledge of the process will be a key element to acceptability of the vehicle that underpins that process. It implies that those students and tutors who have experience of using portfolios as a means for evidence collection or as a means of performance assessment and reflection will be those groups where e-portfolios are more likely to be successful.

Purpose

One of the biggest hurdles to be addressed during the implementation stage is ensuring that the student understands not only the process of implementation, but the reason for that process including the institution's viewpoint on why the particular e-portfolio is being adopted (Roberts *et al* 2005; Tosh *et al* 2005). It is the clarity of purpose that is seen by writers such as Imhof and Picard (2009) as essential if e-portfolios are to be used effectively, and clarity of purpose is seen as the main driver for e-portfolio use (Gaitan 2012). The e-portfolio can be used for a diverse range of purposes within one institution and success may be based on the student seeing the relevance of the purpose on their particular module or course (Cotterill, Alton, Bradley, Hammond, MacDonald, Struthers, & Whitens 2006). It is the purpose of the e-portfolio that will ultimately determine how it is used by the student and the purpose will also inform the design and pedagogy adopted (Barrett 2006; Cohen 2005). The distinction and the interpretation by the user needs to be clearly understood and may impact on its success in the long term (Roberts *et al* 2005). This view is shared by Tosh *el al* (2005) who believes the learning outcome using an e-portfolio needs to be identified for clarity of understanding by the provider and user. It is also the way in which the e-portfolio is adopted across the course and understood that will influence the understanding of the purpose. Evidence from research carried out by Mason *et al* (2004) implies that learning will be successful when the use of the e-portfolio or learning object is seen as part of a holistic course, where the elements are integrated within the place of that learning. The purpose may vary from course to course and from module to module. Therefore the user needs to understand what the purpose is together with the expected outcome from the use of the e-portfolio. Barrett (2004) emphasises the distinction between the use of an e-portfolio for assessment and its use to tell a story stating the different paradigms used. Barrett suggests that for an assessment system a

positivist paradigm is adopted, whereas for a story a constructivist paradigm is adopted. The positivist paradigm is a framework that seeks verification working within agreed norms and practices (Mukherji & Albon 2010). For assessed reflection this refers to assessing against predetermined marking criteria. Reflection is part of construction of knowledge, standing back and thinking about it, but trying to impose a framework on an individual's reflectivity as in this study is a contradiction in terms. By doing so the student is not free to reflect for their own development, but to reflect within the structure of the marking criteria. The difference between the two paradigms Barrett suggests is explained by Maykut and Morehouse (1994) as:

> 'A major difference between the two approaches is not the counting or lack of counting of the occurrences of a particular word or behaviour, but rather the meaning given to the words, behaviors or documents as interpreted through quantitative analysis or statistical analysis as opposed to patterns of meaning which emerge from the data and are often presented in the participants' own words.'
>
> (Maykut & Morehouse 1994:16)

One purpose may be for the student to collect evidence to show their continuing professional development. Barrett (2000) suggests that e-portfolios should support continuing professional development, which is referred to as life-long learning. As stated by JISC (2008) the acquisition of knowledge should extend beyond an educational course and that e-portfolios provide evidence of progression. However, they point out that there are issues relating to portability and sharing of e-portfolios. E-portfolios can be used by students to showcase their achievements (Lorenzo 2005), and as a presentational device when applying for employment. Stefani *et al* (2007) explore how e-portfolios can be used as a tool for life-long learning and suggest it can become a map of life-long learning. However, Woodley and Sims (2011) suggest few students see e-portfolios use beyond the assessment process suggesting that the purpose is understood to be for assessment only.

In order for e-portfolios to be used beyond the course there are issues of access after they graduate and ownership of archived work (Lorenzo & Ittelson 2005).

Technical support

The successful implementation of an e-portfolio will depend on the motivation and enthusiasm of those who use that technology. This motivation will, without doubt, lessen if the problems that occur are not met with immediate solutions. This issue is identified by Wong *et al* (2007) in their research on demand-led total solutions, exploring how an institution can translate hindsight into foresight. It is the ability to anticipate problems and have solutions as well as resources ready to deal with the reality of technology failure. The task of any institution is to minimise the negative problems with regards to technology failure early on as this will undoubtedly affect the motivation of the user. The reliability and availability of computers and input devices is seen as a hurdle by some researchers (Wray 2007; Cotterill *et al* 2004b), as well as accessibility particularly when trainee teachers are on placement as an issue that may affect the successful implement of the e-portfolio. This may be a reflection of the immaturity of the system and over time issues relating to hardware and software may be overcome with experience. How institutions overcome these problems is unclear, as is whether or not these issues are more common to particular types of course. For instance, a university with twenty-four hour, seven day a week opportunities for access to ICT equipment may experience different problems to those ITT providers who offer access to ICT equipment only when students are at their training base and restricted to the hours the office is open.

Management support

E-portfolios that are introduced by institutions who have clear strong leadership and commitment to the introduction of the system will have a greater likelihood for successful

implementation than in those institutions without top-level commitment. One explanation for this is that the commitment by these leaders often leads to the substantial allocation of resources (Strudler & Wetzel 2005). They also have the power to ensure that pressure is placed within the department or faculty to participate in the initiative and subsequently encourage the tutors to support the students within their curriculum area in the use of the technology. Tutors interviewed by Peacock *et al* (2009) expressed the opinion that the challenges of implementing an e-portfolio could be overcome by the institutional commitment which they saw as pivotal to the success of the integration of the technology. Research conducted by Strudler and Wetzel (2005) concluded that large-scale implementation of e-portfolios benefits from both pressure and support.

E-portfolios are often designed by the education provider without the involvement of the end user, particularly in large organisations where the decisions being made are institutional decisions with organisational wide tools and infrastructure (Kirkwood 2009). This can affect the way the application is adopted as it is viewed as a system being imposed, a compulsory element which can be seen as an add-on to individual courses or within particular faculties without prior involvement or consideration of the needs of the individuals involved in the delivery and use. As Mee (2008) suggests, it is often the case that e-portfolio design is provider-led (institution) rather than considering the needs of all stakeholders (tutors and students), often referred to as a top-down approach. He goes on to explore the issue further in that the decision of tools available and design of the e-portfolio are provider led, inferring that they may not meet the needs of the user. Mee (2008) concluded that quite often the structures were too rigid giving students little opportunity to address their own learning needs. This will affect the motivation to use the system if those who use it do not feel they have ownership, as it will be seen not only as an imposition but a system that does not necessarily fit the user's needs. Imhof and

Picard (2009) concluded that without a clear understanding of purpose and ownership then the implementation of an e-portfolio will be flawed. However, writers such as Murray and Smith (2006), exploring the factors which impact on the type of engagement, imply that ownership has little impact on engagement, suggesting that users do not need to see e-portfolios as an imposition because they are designed and implemented by another. Drent and Meellissen (2007) on discussing the issue of implementation imply that the successful implementation of an innovation is centred on the need for both a bottom-up and top-down involvement in initiatives. This implies that those providers who involve the users in the design process, or provide an e-portfolio with the capability for personalised design will give the user the sense of ownership over the construction of their individual on-line work spaces. However in large institutions it may not be a feasible option to consult all stakeholders and implementation may be decided by a working party. The pivotal factor may be whether a technology is perceived to be introduced because of a genuine need or because of a trend. It is a widely held belief that, for the successful adoption of e-portfolios, the implementation should be seen as a holistic approach across courses with an over-arching commitment to be seen as a product that is convincing to the audience, relevant to the aims and objectives of their training course (Henry 2001). As outlined by the University in which the research took place:

> 'For the online aspect of a well-managed blended learning unit to work most effectively, students need to be provided with a clear and transparent structure for navigating the contents of the course and – at least at the beginning of students' learning – a scaffolded approach to the activities you have devised to facilitate their learning.'
>
> (Research University 2011[8])

[8] University identity withheld in accordance with ethics committee guidance.

Therefore, the implication is that institutions implementing e-portfolios within the curriculum areas where they are fully embedded linked to the aims and objectives of the course, not just for assessment purposes, are the ones that will be successfully implemented.

Costs

Another aspect that needs to be considered by institutions is the cost of implementing this new technology and maintaining the momentum as the year progresses. As Roblyer and Knezek (2003) point out, few studies have been undertaken in this area that explore the justification of integrating technology-based methods within institutions when considering the costs. These costs are not restricted to the procurement of a system, whether commercially purchased or developed in-house and ongoing costs of web based storage, but the maintenance of the systems, employment of administrative staff, continual training and software development as needs change over time. It is a conclusion of much research undertaken that students will need to have a high level of technical support when adopting this new technology, and this will invariably impact on costs (Bartlett & Sherry 2006). McNair and Galanouli (2002) explore this further by implying that it is a continual requirement with those involved needing to constantly upgrade their skills.

Technical capabilities

Young (2008) explored the skills of the user in the actual success of the e-portfolios and that students are disadvantaged if their technological skills are limited, this having an influence on the level of training needed. The view that ICT capability is a key aspect in the acceptance and use of e-portfolios is discussed by Krasna, Bratina and Kaucic (2007) who express the opinion that, when introduced on courses where the participants are ICT

aware, the overall results are positive, in particular in the process of speeding up communication. This implies that those who are competent users of ICT will exploit the e-portfolio in a way that those with lower level skills may be unable to achieve. Wray (2007) would agree, and is of the belief from research undertaken, that those with a strong technology background have a distinct advantage over those who either have very little confidence or are novice technology users. This view is shared by Young and Lipczynski (2007) who suggest students need a good level of competence from the outset and that ICT training is imperative. The need to ensure that those using e-portfolios have the skills and knowledge to actively engage in the process is cited as being fundamental in the success of this way of working. Along with time issues, this is one of the main focal points running through research. However, what is unclear is whether participants believe it is training to use a specific application or a more holistic approach to training that is needed. The evidence appears to suggest that participants may require hands-on experience in the creation and development of e-portfolios as this will make them more aware and give them practice in using the technology, leading to a more reflective understanding of the system (Arap 2007). If, as suggested, participants have a need for training, then this has an influence on the cognitive load, as they will need to learn about how to use the e-portfolio for the completion of their studies, as well as training to be a teacher (Woodward & Nanlohy 2004). When discussing the use of technology (not specifically e-portfolios), they suggested that the use needs to become normalised and unless technical capabilities are addressed, may not become part of everyday practice. As Den Doolvan and Kirschner conclude:

> ‘What really counts at the end of the day is if teachers and learners feel that ICT tools are a ‘normal’ part of their competences.’
>
> (Den Doolvan & Kirschner 2004:176)

Training and support for tutors and students

It has been argued that teachers are not adequately trained to use technologies and this has a detrimental effect on their ability to support learners (Green & Hannon 2007). McNair and Galanouli (2002) agree and imply that it is a continual requirement with those involved needing to constantly upgrade their skills. As stated by Laurillard and Masterman (2009), only a very small amount of expenditure has been invested in the development of teacher's ability to use new technologies, whereas a great deal has been invested in these technologies themselves.

Some researchers also conclude that students who engage in using e-portfolios often need significant support and if tutors do not have a good level of understanding then they will not be able to support the students (Bartlett & Sherry 2006, Woodward & Hanoly 2004). If the more informed other is a missing element then students' learning cannot be scaffolded through the zone of proximal development (ZPD), thus preventing opportunities for development through interactions. It could be inferred that lack of tutor skills will have a negative impact on success of e-portfolios if they are based on the theory of social constructivism. It could also be assumed that the 'net generation' have the skills to use the tools, but not necessarily these tools as a means of learning. This is highlighted by Grier, Denney and Clark (2006) who concluded that students needed ongoing access to training when using this technology.

There are a number of pragmatic issues regarding the creation of an e-portfolio. Among them are the process of data collecting and uploading which is a relatively simple skill and only limited by the available on-line storage space the e-portfolio provides. However, the process can be time-consuming and there are issues relating to validity of evidence (Grier *et al* 2006). Grier *et al (*2006) discuss how students need to be aware of the legitimacy of evidence tagged, how this is to be validated and are often anxious about the

evaluation process. Secondly, there is the maintenance of the e-portfolio which may be a time consuming activity as the student will need to select appropriate artefacts.

Although lack of skills is seen as a fundamental problem, little research appears to have been carried out to identify whether there is any correlation between excellent IT skills and success in producing e-portfolios, how institutions support students beyond training on how to use a specific software package and whether the appearance, as highlighted by Tosh *et al* (2005:7), is 'more important to students than the content'. Hallman (2007) would agree with this view and suggests that the focus for students is the end product rather than looking at the work in progress. As documented by Meyer, Abrami, Wade and Scherzer (2012) it is important that students focus on why they are using the e-portfolio, and what it for is, rather than focus on how to use it. This will centre the students' attention on what the learning outcomes are rather than how to use the tool. This is difficult to achieve when students are faced with technology they are unfamiliar with but there is agreement in the literature that success is seen when the e-portfolio is perceived as high-value, where all the elements are integrated (Henry 2001).

Perceptions of tutors

Higgison, Curnat and Murray (2006) and Murray and Smith (2006) suggest that tutors who perceive that they are under pressure to use a particular system of technology in their teaching, will view the intervention negatively and this will ultimately affect the way in which they adopt the technology in their teaching. Often when the implementation of an e-portfolio is demand-led then they are more effective as the user can see the benefits, whereas a compulsory implementation does not, necessarily, ensure that the tutors will be committed (JISC 2008). As also suggested by JISC (2008) e-portfolios should be about people not about technology, they should be supportive and benefit the user. New initiatives tend to be time-consuming and require additional effort, particularly in the

learning of new skills. Talking in an educational context, Fullan states it is not only the new skills but the understanding of '...how and why the new innovation is being used; this can challenge the beliefs of the user' (2007:36).

How the tutors perceive the new initiative will reflect on their own perception of the value of the technology, the additional time commitment and realisation of the benefits that it will bring. It is teachers' beliefs about the purpose of the technology along with the theory that underpins their pedagogy that may explain the motivation for use. Hermans, Tondeur, van Braak and Valcke (2008) for example, showed through their research that the determinant for teachers using computers was that those teachers who held constructivist beliefs were more likely to use technology.

Benefits to tutors and/or to the students of using e-portfolios need to be evident, if they are then tutors may invest in the technology. However, the disparity between the potential learning benefits and actual outcomes, documented by Becker and Jokivirta (2007), Zemsky and Massy (2004) and Kirkwood (2009), may be a de-motivating factor in the continued use of a system. This is explored by Meyer, Abrami and Wade (2012) who cite expectancy theory to explain the different levels of motivation in teachers to use technology. This means that teachers will behave in a certain way because they are motivated to behave that way by the anticipated result of that behaviour.

The climate of the institution is an important consideration when implementing change. Within organisations there will be those who embrace change, those who are suspicious and will require support and those who will attempt to block change and become obstacles to the success (Roper & Pettit 2002). The value placed on the use of technology may also vary enormously (Blin & Munro 2008; Mahdizadeh & Mulder 2008). Sharing of ideals by the institution at the early stages will give tutors the opportunity to question the introduction, but without the support of tutors then the success or otherwise of the

new initiative will be in jeopardy. The process of embedding a change in the working practices may take as long as three to five years, therefore tutor buy-in is essential as without this commitment the initiative may flounder (Hall & Hord 2001).

Another perception that the tutors may have, which may or may not be founded in actual provision, is that if support lacks reliability and is also inadequate for their needs, then this will be a barrier to uptake (Davies & Smith, 2006). It is understandable that tutors who are taking a leap of faith using a e-portfolio for the first time, possibly changing approaches to teaching and learning, would feel trepidation if the support both in the form of technology and training is a sparse resource covering the needs of a large university (Haywood *et al* 2000).

Perceptions of students

The students come to the course with individual prior experiences and it is these, according to Evans, Hodkinson, Rainbird, Unwin (2006), which will influence their perception with regards to engagement opportunities as well as presenting barriers to learning. The perception of the students of the purpose of the e-portfolio will have a great influence how they use it in practice. As previously stated, in order to shape the views of the user, it is imperative that at the early planning stage of the course the technology is embedded in the curriculum (Young 2008).

Research investigating three different e-portfolio designs concluded that ease of use was a significant factor in acceptance by students, as well as possibilities for a career portfolio for use with prospective employers (Banister, Vannatta & Ross 2006). However, Murray and Smith (2006) highlight two different important issues which ultimately affect the engagement of the user as relevance and feedback. Firstly, students who may view compilation of e-portfolios as yet another assignment and secondly, along with

participants in studies who stated they 'hate working with their e-portfolios', their diffidence may be due to their perception of the value of technology (Bergan 2007:199). If students perceive e-portfolios as 'add-ons' to the course, do not see their relevance in the training programme or in their own development, then they may see the process as a 'jumping through hoops' exercise, something they have to do in order to pass a course (Tosh *et al* 2005). Students who understand the rationale underpinning the use of e-portfolios as a pedagogical tool and who are in control of the design of their e-portfolios, however, are more likely to feel a degree of ownership; this may give them motivation to use the system. However, when the e-portfolio is seen only as part of the assessment process they may perceive the process as evidence collection and reflection journal keeping, as a task they have to complete in order to pass an element of the course, for an audience rather than for the individual's own learning. As Studler and Wetzel suggest the creation of the portfolio may well be perceived as to 'satisfy outside readers' (2012:163). The use of e-portfolios for assessment is a relatively new trend (Wetzel, Strudler, Addis & Luz, 2009; Baston 2010) and it is implied that problems with use will be experienced if they are used for multiple outcomes where the learning in different domains may not be compatible (Barrett 2004; Buckridge 2008). The suggestion is that if adopted for multiple purposes then none will be achieved. However, other more recent research by Strudler & Wetzel (2012) has suggested that it is possible for e-portfolios to be used for a variety of purposes by ensuring:

> 'Clarity of purpose and buy-in by university staff.
> The Teaching Standards should be the top level of purpose rather than a sub-set of the e-portfolio which require 'increasing specificity.
> A balance between prescribed elements and self-selection by student.
> Formative feedback.
> Make the best choice of e-portfolio tool matching the course requirements.
> E-portfolios are developed by students for multiple audiences,.
> By making sure the task of e-portfolio construction is do-able.'
>
> (Strudler & Wetzel 2012:169)

In addition, the use by staff modelling the use of an e-portfolio will heighten the importance a student will place on the e-portfolio as a tool for learning. If they do not see this modelled then they may well question the validity of continued use, leading to variations in how and when they are used across a faculty or course (Kirkwood 2009).

2.9 Reflexivity and the researcher

Research, as suggested by Finlay (2002), is a representation of all the participants including me as the researcher and the relationship presented as a joint product. This goes further than reporting the experience, as explained by Finlay,

> 'Most qualitative researchers will attempt to be aware of their role in the co-construction of knowledge. They will try to make explicit how inter-subjective elements impact on data collection and analysis in an effort to enhance the trustworthiness, transparency and accountability of their research.'
>
> (Finlay 2002:212)

It is through self-awareness of my role and the critical examination of the entire research process that I became aware of what was happening (Schwandt 1997:260). This critical examination is referred to as reflexivity; the process acts as a catalyst to monitor and audit the whole research process. Reflexivity enabled me as the researcher to go beyond reflecting on the proper steps research should take and reporting the experience, to an understanding of how the reporting is influenced by me as the researcher and the context in which it takes place. As commented by Bolton (2010) and Cunliffe (2002) reflexivity will not be achieved from habitual experience; it is by mentally standing apart from experiences and viewing them from an outside world that one is able to be reflexive. This is because how we theorise about the world we are in is separate from the experience. To report on the research experience is relatively unproblematic: it is the writing up of procedures and results. However, reflexivity questions this representation of testable theories through deconstruction and reconstruction. As Cunliffe (2002) suggested would

occur, reflexivity resulted in me as the researcher feeling uneasy and unsure especially when I began to critique the University's approach to conceptualising and implementing the use of e-portfolios as a pedagogical tool. Ellis and Bochner suggest reflexivity is 'a personal tale of what went on in the backstage of doing research' (2000:741); the inference drawn from this statement would suggest that reflexivity is a description. However, reflexivity is not just about telling the story of the research, nor was it just about my ability to be objective or subjective, but, as suggested by Steier (1991), a representation of the space between subjectivity and objectivity where researchers, together with participants, co-construct knowledge of a particular situation. Therefore, to be reflexive, researchers such as myself in the current study, have to think beyond their personal place in the setting, context, and social phenomena being studied and question themselves, their position, their biases and preferences within that context, leading to an act of deep examination. This was not an easy task for me in this research. I brought with me a complex mix of situated experiences from lifestyle, dispositions, values, expectations and biases. This background is referred to as *habitus* (Bourdieu 1989), the structure and totality of an individual's thoughts. It was through this close examination of my position, both as a researcher and an individual with complex thoughts and feelings, together with an understanding of the relationship between myself and the participants, that this self awareness was achieved, leading to a transparency in the research process, thus reflexivity.

Reflexivity through self awareness

I recognise Archer's (2010) argument that self awareness through deep examination occurs as an internal conversation or dialogue that acts as a go-between between our internal personal concerns and external worlds of the social contexts in which this occurs.

It is a process of self analysis and self disclosure (Bolton 2010; Finlay 2002). Reflexivity is a complex process and has been defined by Fook as,

> 'a stance of being able to locate oneself in the picture, to appreciate how one's self influences [actions]. Reflexivity is potentially more complex that being reflective, in that the potential for understanding the myriad ways in which one's own presence and perspective influences the knowledge and actions which are created is potentially more problematic than the simple searching for implicit theory.'
>
> (Fook 2002:43)

Like Finlay I found that reflexivity was not a straightforward process:

> 'The process of engaging in reflexivity is full of muddy ambiguity and multiple trails as researchers negotiate the swamp of interminable deconstructions, self analysis and self disclosure.'
>
> (Finlay 2002:209)

It was through reflexivity that I as researcher deconstructed the research process in order to understand what was happening. Here the researcher 'appears not as an individual creative scholar, a knowing subject who discovers, but more as a material body through whom a narrative structure unfolds' (Bruner 1986:150). This implies that reflexivity refers to our human capacity to consider ourselves in relation to our contexts; and our contexts in relation to ourselves (Longhofer, Floersch & Hoy 2013) and in the process 'self-reflexivity unmasks complex political/ideological agendas hidden in our writing' (Richardson 1994:523). Reflexivity is not necessarily about questioning what has happened but about what might have happened if the research had been conducted differently, for example if different research questions had been asked or different methodological tools adopted. In the concluding chapter of this thesis I have discussed these possibilities in section 7.3section when discussing limitations of the research. Kleinsasser says that this dynamic process gives qualitative research its 'pulse' (2000:155). She posits this goes further than merely confessing what has happened; it enables the researcher to unpick the personal and theoretical, and enables one to

'scrutinize ethics and epistemology' (Kleinsasser 2000:161). Cunliffe agrees and states that 'reflexivity challenges us to address fundamental questions about the nature of reality, knowledge and our own ways of being' (2002:999).

Different approaches to reflexivity

It is important to position the current study within other views of reflexivity, such as Finlay (2010), who suggests five different kinds and Archer (2003) who puts forward four modes of reflexivity. The five different kinds suggested by Finlay (2010) are 'introspection' as personal revelation, 'inter-subjective reflection' by exploring mutual meanings, 'mutual collaboration' with participants in dialogue, 'social critique' managing the power imbalance and 'discursive deconstruction' going beyond what is written. Archer (2003), however, suggests four modes of reflexivity: 'communicative reflection' undertaken by dialogue with another before action 'what to do, how to act, and, ultimately, who to be, are held open to the dialogical influences of those with whom they share their concerns' (2006:167). The second mode is 'autonomous reflection', an internal dialogue leading to action. Commenting on this Longhofer *et al* (2013) suggest that 'autonomous reflexivity' is essential for genuine engagement through seven positions:

> '(1) personal (or standpoint, (2) ontological, (3) epistemological, (4) methodological, (5) theoretical (analytic), (6) normative, and (7) representational.'
>
> (Longhofer *et al* 2013)

Archer's third mode 'meta-reflexives' is the internal conservation which is self-directed, and comprises of critical reflection of ourselves and our concerns in relation to society. The final mode is 'fractured reflection' where the individual feels no authority and is trying to find a resolution to personal concerns.

As a PhD student I particularly recognised Archer's modes in the process of research. For instance, 'communicative reflection' has been my life as a PhD student for the duration of the research in constant dialogue with the supervisory team on future action, 'autonomous reflection' meta-thinking about reflection-in-action and reflection-on-action (Schön 1987) as the research process unfolded, 'meta-reflexives' the reflexivity that occurred when composing the report with the decisions for example of what goes in, what is left out and how data is presented. And finally, 'fractured reflection' when, as a PhD student I felt perplexed and confused over what was happening and why as my self-belief, values and biases were tested through the outcome of the research.

It is through the exploration of the literature on reflexivity that I have been able to recognise my position in the research and how the experience of carrying out the research has influenced me, both as a professional and an individual. It has enabled me to make sense of the highs and lows of my experience through the construction and deconstruction of the findings. For example the experience of interviewing students in the pilot left me feeling perplexed due to the negativity of responses. However, it was through the analysis of my feelings situated in this experience that I become to understand my position as researcher, and understand how my background story influenced the way in which I responded emotionally to the participants' stories. It was through understanding the literature in this area that I was able to make sense of my reflections. It enabled me to identify how, in the reporting of the research, I was developing my understanding and knowledge and what was happening. This understanding went beyond telling the story of the research but by understanding the background to that story.

Critique of reflexivity

The process of reflexivity is not without its critics. Critique of reflexivity such as Potter and Wetherall (1995) express the view that the emergent nature of researchers' findings

may be disguised or hidden by focusing on reflexivity, and that meanings may be lost through the constant deconstruction and, as stated by DeVault, 'I sometimes worry that the recent emphasis on the personal may signal a retreat from the attempt to interpret a wider social world' (1997:225). However, as a researcher reflecting on my own work I would agree with Flood in that 'without some degree of reflexivity any research is blind and without purpose' (1999:35). Perhaps as proposed by Finlay, referring to the act of reporting reflexivity in research, 'researchers are damned if they do and damned if they don't' (Finlay 2002:227).

2.10 Critique of University's approach

At the time of this study there had been considerable research into the use of e-portfolios, particularly when they are to be used as a repository (Sutherland & Powell 2007). The University course leaders should really have been aware of research outcomes relating to issues of assessing reflection (Strudler & Wetzel 2005), and the implementation of an e-portfolio (Strudler & Wetzel 2005; Gathercoal *et al* 2002; Cotterill *et al* 2004b; Roberts *et al* 2005; Tosh *et al* 2005;Wray 2007; Cotterill *et al* 2004b; Roblyer & Knezek 2003; Young 2008; Green & Hannon 2007), and taken these into account before beginning the implementation process at course level (see section 2.7 and 2.8.4). The outcome of the research implies that this did not happen, as reported in student and tutor interviews.

PebblePad, a commercially designed e-portfolio, was in the process of being 'rolled out' across departments when the research was conducted. The purposes for the introduction of e-portfolios at the University included:

- Enabling students to gather evidence of learning from a variety of sources (academic, workplace and personal);
- Supporting development over an extended time period;
- Providing an evidence base for review by tutors, employers and others;

- Enabling distance travelled to be observed as well as the demonstration of specified outcomes.

(2012:online[9])

The above implies that the vision for the use of the e-portfolio tool was to provide a tool for the collection of evidence of achievement from multiple sources over a period of time. It is also implied that the e-portfolio of evidence would be used to support the individual in meeting course expectations and, in addition, provide a record of achievement for use outside the University context. Reflecting on the purposes stated above there appears to be a potential tension between the strategic decision-making level on how the e-portfolio would be used university-wide and beyond as an abstract concept, and the pragmatics of achieving this at course level as reported in interviews. As suggested by Fullan (2007) it is how individuals turn this vision into reality that is important. At the time of the research, two of the four distinct phases identified by Alexander and Hedberg (1994) that organisations go through when adopting a new initiative had been achieved, these being design and development at strategic level. The third phase of implementation was in process and, therefore, the fourth phase of institutionalisation had not been met. A critique of the approach of the University to the introduction of the e-portfolio and adoption as a tool for assessment at course level is documented below.

Management support

The implementation in this University could be perceived as a top-down management approach as tutors reported that the commitment at a senior level to use PebblePad was the driving force for this initiative. Choosing one e-portfolio for institution-wide adoption may be considered necessary in order to negotiate costs in the procurement process, ensure equality of provision for all students, as well as guaranteeing alignment

[9] The identity of the participating University has been withheld for the sake of confidentiality with due regard to ethical considerations.

with internal systems, for instance centrally held assessment data systems. As explored by Mee (2008) and Kirkwood (2009) it is imperative that in the planning stage institutions recognise the multi-faceted nature and needs of the different types of courses offered by an institution. Adoption of different systems may be preferable at department level to suit individual staff preferences and individual course design, however, it would be difficult to offer institution support if multiple systems were adopted. The senior managers involved in the introduction at the University were from a range of disciplines which may have been intended to reduce the possible tensions associated with top-down approaches (online:2010[10]). Interview data suggested a readiness of different departments within the University to adopt the e-portfolio inferring that course leaders supported management's decision to implement an e-portfolio. However, there appeared to be a difference in the views about implementation. At Senior Leader level the introduction appeared to be driven by the use of the e-portfolio to document the students' learning journey – prior learning, current learning and life-long learning as stated on the University's website. This anticipated a holistic record of the student's personal and academic life. The department researched adopted the e-portfolio for course delivery, concentrating on documenting the students' progress on an individual course of study. The adoption at department level appeared to reveal a real need for the adoption of the technology, but did not indicate a shared vision and shared purpose, important elements for the successful implementation discussed in the literature (Imhof & Picard 2009; Roberts *et al* 2005; Tosh *et al* 2005).

[10] The identity of the participating University has been withheld for the sake of confidentiality with due regard to ethical considerations.

Slow implementation

The speed of implementation at the University was, according to interview data, driven by the willingness of individual departments and courses within these departments to adopt the technology. Slow implementation across courses and within courses was deemed advisable from previous research studies (Mason *et al* 2004; Kirkwood 2009). In this case, slow implementation across the university appeared to be driven by the capacity of training and administrative support, whereas the rapid speed of implementation at course level was determined by the course leader. The course at the centre of this research adopted the e-portfolio for multiple purposes and implementation did not follow the advice from the literature with regards to slow implementation, (see chapter 4.)

Training

Training is cited in the literature as an important element if the implementation of an e-portfolio is to be successful (Green & Hannon 2007). Therefore it is essential that the training accompanies the introduction so that those adopting the e-portfolio are able to use it competently. If e-portfolios are not adopted appropriately then they can, as explained by a member of the University staff, responsible for implementation of the e-portfolios, 'reinforce negative perceptions and hinder learning' (online:2012).[11] However, providing initial and developmental training sessions will necessitate a significant investment in trainer's time and attendance by staff, as well as the provision of additional training deemed necessary to exploit the potential of the e-portfolio. This is the challenge facing institutions, including the research University: the desire to implement an initiative and making this possible by providing the necessary financial support for

[11] The identity of the participating University had been withheld in accordance with Ethics Committee recommendations, hence the abridged reference.

staff development. As suggested by Roblyer and Knezek (2003), the true cost of integrating technology has not been explored. The alternative is to rely on the goodwill of staff to undertake this professional development in their own time to learn how to use the technology, as well as engage in continuous skill development which is seen as essential if they are to support students (Grier *et al* 2006). Investment in the development of staff is necessary, but, as suggested by Laurillard and Masterman (2009), the focus of expenditure institution-wide seems to be on acquiring the technology not on staff development.

I understood through conversations with personnel responsible for implementation, and tutors who took part in the research that initial generic training on the use of PebblePad as a tool was carried out by an individual who also administered the e-portfolio. In addition, support was provided by 'champions' within the University together with online support in the form of help videos on the PebblePad website. From this training it was expected the staff would be in a position to support students, this is cited in the literature as significantly important (Green and Hannon 2007) as inadequately trained staff will not be able to support students. However, I believe from the outcome of the research that the challenge for institutions is one step after initial staff training, and that is to find a means of supporting staff in the design of their course on the e-portfolio as this was a particular issue in the pilot phase. It is at this stage that the focus changes from tutors learning how to use the technology to ensuring student learning takes place with the e-portfolio as a pedagogical tool. This is explained by Bates (2007) as important to ensure that the focus is on student learning, not on the technology and by JISC (2008) that e-portfolios should be about people not the technology. The danger is that without guidance during design, courses leaders may fail to recognise the potential the technology offers in supporting learning. As explored in chapter 4, the lack of tutor skills was a factor in the failure of the

e-portfolio together with the design of the course. Tutors were unable to support students as they did not have a good level of understanding of how to use the technology or how it could be exploited to support the students (Bartlett & Sherry 2006, Woodward & Hanoly 2004). As a result technology that the tutors were both confident and competent in using was adopted during the main study.

Administrative and technical support

Central administrative support was needed for the e-portfolio and this should, as suggested by JISC (2008), be fully integrated in the institutional support infrastructure. In the current study, technical support for the e-portfolio was provided through the infrastructure of the University; however, the additional work that this created for the departments providing administrative and technical support must have invariably had an influence on costs (Bartlett & Sherry 2006). It is not until the technology is in use that 'teething' problems appear and it is these issues that need addressing quickly, if not users may lose confidence in the technology. During the pilot phase tutors and students reported in interviews that a number of administrative and technical problems were encountered which were not resolved speedily. Investment in additional support at this early stage of implementation may have reduced the time taken in reaching a resolution. As suggested by Wong *et al* (2007) before implementation it is desirable for institutions to turn hindsight into foresight, this requires anticipation of problems with action planning in place which may reduce the loss of confidence that technology failure can provoke.

At the time of the research, administrative support within the University seemed to be lacking from the perception of tutors and students as this was provided by one member of staff. However, this is a costly exercise in terms of allocation of key members of staff to carry out these duties, particularly in the early days of implementation before a new

initiative is 'normalised' in the life of the University. Den Doolvan and Kirschner (2004) suggest this normalisation occurs when ICT tools become part of users' everyday competency. Nevertheless, this role will not diminish with time as the new students and staff joining the University will require administrative support and those leaving will need to be removed from the system. De-centralisation of this support may be the resolution; however, this will only be possible if administrative capacity at departmental level is available to be trained and able to maintain the e-portfolio.

Purpose for adoption of an e-portfolio

As previously stated, the University's decision to adopt PebblePad was stated as for the students' academic and personal development. For ITE courses within universities, such as that researched, this invariably involves the assessment of evidence against a competency checklist of Standards imposed by the TA, together with assessment of assignments for Master level credits. Therefore, there are two distinct areas, one to prove trainee teachers have met the Standards and are therefore worthy of the award of QTS, the second a record of academic achievement. The course designers face a dilemma in relation to the twin function of the e-portfolio as being a possible repository for evidence of competencies but also a tool which enables the iterative discussion of issues and, therefore, the development of reflective thinking as will be seen in the outcome of the pilot (chapter 4) and the outcome of the main study (chapters 5 and 6).

It is a widely held belief that reflection is a necessary skill for trainee teachers as without being able to reflect they will not improve their practice (Marcos *et al* 2007, Children's Services and Skills 2010). This is evidenced by demonstrating they meet Teachers' Standards, however, these Standards require the trainee teacher to demonstrate achievement of meeting the Standard but do not apply a 'level' that needs to be attained, therefore it cannot be determined what constitutes a pass. It is the task of the person who

assesses the evidence against the Standards to make a judgement on whether or not the evidence demonstrates meeting the Standard. As discussed (section 7) it is by meeting these Standards trainee teachers show, according to the Teaching Agency that they are able to make improvements in teaching and learning leading to development as a reflective practitioner. However, reflection is, in itself, a contested concept. It is dynamic in nature and is not compatible with a quantified assessment approach which is necessary under the requirements of evidencing against the Standards, and, therefore, enabling trainee teachers to gain QTS. It is suggested that reflective teaching needs to be learned, with support from an experienced practitioner, as the learning process will promote a reflective approach beyond the training period (Ashby *et al* 2008). This implies that social constructivism underpins the learning and that some form of assessment is required to ensure reflection takes place. The course leaders designed a module to be used on the e-portfolio where students responded by recording their reflections and these reflections were assessed. However, assessment may influence the way in which an e-portfolio is used by students who may not freely reflect their experiences due to compliance with assessment criteria (Strudler & Wetzel 2012). Therefore motivation to use the e-portfolio when the contents are assessed may be driven by the assessment process with the focus on the product rather than the process (Tosh *et al* 2005; Hallman 2007). This is problematic, particularly as e-portfolios are marketed as a tool for encouraging reflection. There is little evidence that the course tutors, for whatever reason, took account of these issues.

Assessed reflection in ITE

Recent reviews of ITE have commented on insufficient trainee teacher reflection both during the training period and beyond such as Penso, Shoham & Shiloah 2001, Butler, Novak, Jarvis-Selinger, & Beckingham 2004, McLellan 2004, and Tillema 2006. If the

purpose of using an e-portfolio is to encourage reflection then consideration on how this will be achieved needs to take place with an acknowledgement of the issues raised in the literature. Most importantly are issues related to when assessing reflection what constitutes a pass, how is this assessment marked and how a structure of marking can be applied to the dynamic process of reflection thinking. The continuous assessments of the contents of e-portfolios are time-consuming, often resulting in work that is never finished. There are contentious issues such as marker subjectivity (Strudler &Wetzel 2012), students writing strategically to pass an assignment (Hargreaves 2004), breadth of student experience (Carney 2002) and the lack of which that may result in fictional writing to pass the assessment (Hobbs 2007). The outcome of my research revealed that assessment was a significant issue with regards to the amount of tutor time providing formative feedback at timetabled points in the course. This may have been alleviated if the views of Ashby *et al* (2008) had been considered. They posit the responsibility of ensuring that reflective teaching is learned is the task of the school mentor. This would suggest that a course designed with tutor and mentor feedback in the assessment process may benefit student learning. The authenticity of student reflection is also in question if assessment is carried out by the tutor alone. If student reflection is perceived to be at variance to the tutor who will be marking the reflection and, therefore in a position of power, the student may respond by writing what they believe the tutor wants them to say (Sutton *et al* 2007).

2.11 Summary

This chapter has investigated the literature regarding the use of e-portfolios in teacher training. The main issues from the literature review to be taken forward in the research

are briefly commented on below. The issues will be understood from the perception of the tutors and students who use the e-portfolio as a pedagogical tool.

Theories of learning and associated pedagogy

It is important that all users understand the underpinning theory of learning and pedagogy if the e-portfolio is to be used successfully as a pedagogical tool on a course. The underpinning theory of learning and pedagogy supporting the development of reflective learners through assessed work will be analysed to better understand how the learner is supported by the more informed other.

Reflection

As explored in the previous section, reflection is closely associated with the socio cultural development of learners and is seen as an important part of teacher training. The literature review discusses the varying definitions of reflection and how reaching a shared understanding of the act of reflection is problematic given the varying viewpoints. However, when the e-portfolio is adopted for the purposes of reflection, it is paramount that both tutors and students understand the purpose particularly when the reflection is assessed. The assessment of reflection is challenging due to the issues of an imposed framework of reflection resulting in writing to assessment criteria, lack of experience of the student in the act of reflection as well as inexperience of the context and objectivity of marking. As discussed the challenge is to set guidelines enabling assessment whilst the student remains in control and has ownership of the reflections.

Adoption on course

The tutor's acceptance of the e-portfolio as a pedagogical tool is fundamental to the success of the implementation. This includes understanding of why the tool is adopted, with a shared understanding of how it will be used to support the learning process, the

skills needed and the time to provide feedback in the role of the more informed other. Students need to understand the purpose for the e-portfolio, how it will be used consistently by the tutors and the expectations of the tutors. In order for both tutors and students to achieve a mutual understanding and use the e-portfolio as a pedagogical tool then they will need the skills to use the technology as well as skills in meeting the course objectives. In addition, technical and administration support from the institution is essential. This includes high level management support of the introduction of the e-portfolio along with day to day administration and technical support.

Implementation

Slow implementation is seen as fundamental in the success of the e-portfolio, together with prior experience and a shared purpose. The purpose should be clearly understood by all participants as this will enable them to understand the relevance and their individual roles in the construction of learning. As mentioned the technical support offered and technical capabilities of those using the e-portfolio will influence the successful use and participants satisfactory.

Research questions

The literature review provides a background of research on e-portfolios to be considered in understanding the case studies of this research in order to address the research questions.

The next chapter will focus on the methodology adopted to investigate the four research questions of ‘What are the key factors impacting the implementation of e-portfolios?’, ‘How are e-portfolios used by trainee teachers?’, ‘Is there a relationship between the use of e-portfolios and the development of reflective learners?’ and ‘Do e-portfolios support Continuing Professional Development?’

Chapter three: Methodology

3.1 Introduction

This chapter explains how and why particular research approaches were selected and developed from the pilot phase, case study one, and implemented in the main study, case study two. It also provides a description of the tools and processes used for data analysis in both case studies.

As previously stated the purpose of the research was to investigate the use of the e-portfolio as a pedagogical tool to support the development of reflective practice, in order to better understand the key factors that influence the implementation and, how this technology was used by students and tutors. Initially the intention of this research was to investigate the pattern of e-portfolio use including its frequency, point in the course, student location, nature of student-tutor interactions and the response to feedback in relation to the two elements of the course where the e-portfolio was used, namely 'Tasks' and 'Themes and Issues' using a quantitative approach. Initially also, the investigation was intended to construct an understanding of what was happening and why from the perspective of the students and tutors, giving a voice to these two groups of participants through the use of an interpretive qualitative methodological approach. For this reason, a mixed methods approach was adopted. It became apparent in the first year of research, however, that in order to determine the relationship between the use of the e-portfolio and the development of reflective learners it was essential that I carry out an analysis of the written work uploaded to the e-portfolio. This was necessary to establish whether or not the e-portfolio enabled the students to develop as reflective learners and, if so, how this

was achieved. Therefore, identifying an appropriate analytical framework for this analysis became important at this point. The particular framework for analysing the depth of reflection apparent in students' written work is discussed in 3.8.5.

My intention was to share the results of this research with the wider initial teacher education community by reporting on how e-portfolios were used by students and tutors, the process of student reflection as supported by the more informed other and also to provide insights into the use of digital educational technology.

In order to fulfil the purpose of this research as outlined above, the research took the form of two case studies in one institution: one pilot and one main study. The pilot phase was designed as a feasibility study as well as a comparative study to trial the research methodology, tools and method of analysis for refinement in advance of the main study. In both studies, data were collected through course documentation, questionnaires, interviews, and the records of student/tutor interactions on the e-portfolio, and, in the main study, the samples of reflective writing that had been uploaded. Through this data collection it was possible to understand the perspectives of students and tutors using the e-portfolios and, at the same time, develop an understanding of the points in the course and the learning context in which students tended to upload materials to the e-portfolios, as well as the way in which reflective practice evolved throughout the course.

3.2 Methodology applied to a case study approach

Decisions that inform the design and selection of research methodology are dependent on the nature of the enquiry and the kind of information sought (Bell 2005). Case study methodology, as a predisposing approach, allows the researcher to 'think' deeply about the exploration of a phenomenon beyond the descriptive features by also studying the surrounding context. As Yin (2003:14) suggests, case study as a research strategy

comprises, 'an all-encompassing method – covering the logic of design, data collection techniques, and specific approaches to data analysis' (2003:14). This point is explored further by Cohen *et al* who comment that case studies:

> 'provide a unique example of real people in real situations, enabling readers to understand ideas more clearly than by simply presenting them with abstract theories or principles ..... case studies can penetrate situations in ways that are not always susceptible to numerical analysis'
>
> (Cohen *et al* 2011:289)

In the current research, case study methodology was adopted to investigate the use of e-portfolios as a pedagogical tool within the complexity of teacher training from the perspectives of tutors and students in a longitudinal study, identifying changes over time. This approach enabled an investigation into patterns of behaviour, comparative judgements on the effect of context, a detailed examination of tutor and student views and opinions together with, in case study 2, a focused enquiry into the process of reflection by the students.

Case studies defined

As suggested by Bogden and Biklen:

> 'A case study is a detailed examination of one or more settings, or a single subject, or a single depository of documents or one particular event.'
>
> (Bogdan & Biklen 1982, cited in Wellington, 2000:38)

Other definitions include 'an individual circumstance or event that is chosen either because it is typical or because it is unusual or because there was a problem or because something worked well' (Newby 2010:51); therefore, something that is at either end of the continuum of what can be considered as 'usual' or 'unusual' when applied to a situation. The case at the centre of this research was the use of e-portfolios as a

pedagogical tool on a university based training route for trainee teachers that had recently introduced e-portfolios to support the development of reflective thinking. Prior to the current study research focused on such use was scanty and, therefore, unusual.

A case study might also be defined as 'a bounded system', a system because it involves investigating the interrelated elements thus providing an holistic account of 'entities that have parts and that act or operate in their environments', and bounded as it is important to determine exactly what the case study is, and is not (Johnson & Kristensen 2004:376). This was an important point to bear in mind in this research as the case being studied was one discrete feature in one element of a university led PGCE course. Taking into consideration the different aspects of this study, in the context in which the two case studies were explored, I would suggest that case study here might, therefore, be defined not through specific methodology but as a bounded entity (Stake 1995).

A case study can be viewed as an empirical study of 'real-life', as in this case, where the use of an e-portfolio as a pedagogical tool to encourage reflective activity is embedded in a course underpinned by a social constructivist theory understanding of the learning that is taking place. By collecting data in a non-experimental study in this way, investigating events that had already happened or in the process of happening with no control over the outcomes of the study (Heck 2011), a case study used in this context can be described, in part, as a '...contemporary phenomenon within its real-life context'(Yin 2003:13)

Different types of case study

Having decided that an appropriate methodology to adopt for this research was case study, it was then necessary to identify the type of case study for the complex and situated case of this research. Both Yin (2003) and Stake (1995) have attempted to differentiate case studies into types. Yin identifies three different types of case study – 'exploratory',

'descriptive' and 'explanatory' - adopted according to the type of research question being asked with 'large areas of overlap among the strategies' (2003:7). These are explained briefly as follows. Exploratory means collecting and looking for patterns in the data, with the identification of a model to view this data, usually associated with 'what' questions. Descriptive case-studies gather information on the particular features of an issue. This is achieved by adopting a theory for data collection with research questions focusing on 'how many' and 'how much'. Explanatory research continues this even further by trying to analyse or explain why or how something happens or happened, therefore research questions are more likely to be 'how' or 'why'.

Newby (2010) agrees with the notion of three different types suggested by Yin (2003) and that they are used for different purposes. Newby (2010) indicates that the purpose of a case study is determined by the issue under investigation. For instance, exploration is adopted when we do not know, to establish understanding, explanation is to address why something is happening and description is to record a situation. The case studies at the centre of this research were both exploratory and explanatory to understand how e-portfolios were used as a pedagogical tool and explain why, together with how they supported reflective learning and why this should be. There was also an overlap of descriptive by collecting quantitative data to ascertain patterns of use and context for use and further exploration to establish an understanding of what was happening and why.

Stake (1995) suggests that the more specific the individual case is at the centre of the research focus, the greater the rationale for calling it a case study. He defines two motivations for studying cases as 'intrinsic' and 'instrumental'. Intrinsic is when a researcher is focusing on a specific interest, one case that is interesting in itself. An understanding of the intrinsic nature of case study is important to the research reported in the current study. Exploring the development of theory with regards to trainee teachers'

use of e-portfolios and the development of trainee teachers' reflective thinking supported by the e-portfolio as a pedagogical tool has an intrinsic interest of its own. However, the description of the case study as instrumental 'where the case serves to help us understand phenomena or relationships within it,' (Stake 1995:77) implies an understanding of how a situation can be understood outside of the particular case being investigated. In this type of case study the case being investigated is used to facilitate the understanding of something else, as in this research. The implication is that the case study is not being investigated to understand a particular incident as with intrinsic, but that the development of an understanding of a particular case study will lead to moving beyond a particular case. My research might therefore be seen as 'instrumental' in this sense. For instance, although it is acknowledged that this research focuses on two case studies and, therefore, cannot be seen as representative of similar courses in other universities, findings within these case studies may contribute to the development of theory regarding the use of the e-portfolio in general terms, together with a greater understanding of ways to facilitate the process of reflection. Leading on from this there is the possibility of sharing the findings within the teacher training community.

The question of whether or not the current study comprises two single case studies as defined by Yin who suggests there are single, holistic and multiple types of case study requires some explanation. Multiple case studies allow for the comparison between different studies enabling the research to explore the differences; this is adopted when similar results are predicted or contrasting results based on theory are predicted (Yin 2003). A holistic case study investigates a case in one environment because it is unique or extreme and, therefore, allows for the research of one particular case. A multiple or collective allows the research to be conducted within each setting and across each setting, however the context is different, whereas a holistic case study by virtue of its uniqueness

is limited to one case (Baxter & Jack 2008). As this research explores two cases across two cohorts of students, both within the context of one University but with the context of school placement different for each student, and each cohort using a different e-portfolio platform, it can be considered as a multiple case study. This is because the analysis of, and comparison of the use of the e-portfolio for each cohort was important. Further, there is one additional essential difference between the two case studies: the second case study contains a very important analysis of reflective writing that does not appear in the first case study.

Constraints of case study research

Case study methodology is challenging and described by Yin as needing the adoption of a 'rigorous methodological path' (2009:3). The nature of case study is that the data gathering is situated in the context of the research and drawn from participants' everyday lives. As a result case studies present the researcher with issues regarding availability of researcher time in collecting data, especially when the participants in the research are based in different contexts at different times in the course. Investigating case studies is a time-consuming activity and something that a part-time researcher must consider at the research design stage to ensure that the data collection methods are achievable and the timeframe for collection realistic. The two case studies were also limited in terms of generalisability as the data was collected from one university, one sample of tutors and two cohorts of trainee teachers working with two designs of e-portfolios and trustworthiness of results, as discussed in the following two sections.

Issue of generisalisability

I acknowledge here that case studies are unique (Bell 2005) and that generalisation from an individual case study is problematic as the strength of a case study is that it represents

itself (Cohen *et al* 2011). Saying this, however, they can help us in understanding similar cases and as Cohen *et al* (2011) point out it is not the statistical connection but the logical connection between the case in question and wider theory that can be tested in other cases. As suggested by Denscombe:

> 'The extent to which findings from a case study can be generalised to other examples in the class depends on how far the case study example is similar to others of its type.'
>
> (Denscombe 1998:36)

The view of Stake (1995) is that the issue is not generalisation but particularisation which he explains as follows:

> 'The real business of case study is particularization, not generalization. We take a particular case and come to know it well, not primarily as to how it is different from others but what it is, what it does. There is emphasis on uniqueness, and that implies knowledge of others that the case is different from, but the first emphasis is on understanding the case itself.'
>
> (Stake 1995:8)

Cohen *et al* (2011) suggest generalisation can be applied to any single experiment or case study if it is considered as 'part of a growing pool of data' (2011:294). They expand by suggesting that the strength of case studies is their contribution to the expanding knowledge and contribution to the generation of theory. However, writers such as Robson imply that a case study can provide a valuable insight 'if it can work here it can work anywhere' (2002:182). This is by using the case study as a means to try out a new idea or project, or set of circumstances to gain a valuable insight on the success or otherwise before taking the new idea to a wider audience. In this study it cannot be assumed that the results can be generalised for all teacher training courses, as this case is specific to a PGCE course in a particular University in a particular context. Further not all teacher training includes the award of a PGCE but offers QTS only or a mix of QTS and Masters work. In addition this course followed a timeline of experiences in different contexts at different times and other courses may apply a different timetable of

experiences. However, what case study enabled was a deep understanding of the use of e-portfolios from the perspectives of students and tutors together with the way in which they engaged with the technology with regards to frequency, context and type of interaction to add to the expanding knowledge. In addition the investigation of the process of trainee teacher reflection supported by the e-portfolio as a pedagogical tool, provided uniqueness to the study whose methodology and research techniques may be replicated in other cases to establish whether, or not, there might be an element of generalisation that can be assumed across different cases.

Trustworthiness of case studies

Case studies have been criticised as they cannot be replicated by others because the context for any future work will always be different. Applied to my research, the context cannot be replicated but, as already noted (Huberman & Miles 2002) the most important issue here is the trustworthiness of the research process. Trustworthiness applies to both the process and the product of the research. It really matters, therefore, that I have attempted to be thoroughly transparent in my work and that my research has been comprehensive and rigorous. In this study the reasons for selection of the methodology and methodological tools, together with how these were applied throughout the research, were under scrutiny in order for the reader to have trust in the resulting product, which is the argument that the research presents. As suggested by Huberman & Miles (2002) trustworthiness in the process allows the reader to have faith in the way the inquiry was undertaken, and that trustworthiness in the product, the findings, comes from a well designed process. The focus here is on the replicability of the research design and its execution, not the findings. Trustworthiness, therefore, is concerned with confidence in the findings which are the result of well-designed and replicable enquiry (Carine 1995).

Concepts of validity and reliability in qualitative aspects of case study research are highly contested. I explore some of the issues as I see them here, and continue the discussion in a discrete section below (section 3.3). Bassey (1999), for example, clearly states that 'the concepts of reliability and validity are vital concepts in surveys and experiments, but not case study research' (1999:74). The argument being made is that it is clear that all the elements of a case study cannot be replicated and therefore claims that case studies might represent one truth must therefore be untrustworthy. However, there is an argument that validity in qualitative research might, in general terms, mean the extent to which a concept, or conclusion, is well-founded and corresponds accurately to the evidence that has been collected (Arthur *et al* 2012) which, in itself, assumes that data collection has been systematic, rigorous and comprehensive. Reliability relates to consistency and dependability. In relation to the coding of qualitative data, for example, reliability is defined by Hammersley as 'the degree of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions' (1992:67). In my own research I addressed this issue of consistency in the coding of data by using co-coders to cross-check the extent to which my coding was consistent – 'reliable' (see page 132 for fuller description of this process).

In relation to consistency, Nisbet and Watts (1984) put forward the notion that case studies cannot be cross-checked due to the nature of them happening at a particular time, a single instance; therefore they are unique. This is problematic when applied to my research and teacher training as conditions for learning and teaching will not be identical but are unique. This uniqueness may, Nisbet and Watts suggest, result in bias due to the selectivity of data by the researcher. Yin (2003) takes this concern further by commenting that the lack of a rigorous approach to data collection and analysis can be highly problematic:

> 'Too many times, the case study investigator has been sloppy, has not followed systematic procedures, or has allowed equivocal evidence or biased views to influence the direction of the findings and conclusions. Such lack of rigor is less likely to be present when using other strategies.'
>
> (Yin 2003:10)

Even though, as noted already, concepts of validity and reliability are contested by many in qualitative research, Yin (2003) uses the terms 'reliable' and 'valid' in referring to the process of ensuring the research process is trustworthy. Given the views expressed in the literature, it was my responsibility as the researcher to demonstrate that the data had been rigorously collected and method of analysis, using a transparent process, and, therefore, considered as trustworthy. The starting point for this to happen was by the acknowledgement and consideration of these issues by me as the researcher who ensured that a systematic approach to my case study research was adopted. I chose to follow the informed approach explored by Yin (2003) who puts forward four tests of trustworthiness: construct validity, internal validity, external validity and reliability. He suggests that the researcher needs to apply all four tests to the methodology. By considering these tests it is likely that the representation of the case study is a trustworthy reflection of the issues under investigation made rigorous through both method and data triangulation. Bassey (2004) suggests these tests may be applied to ensure case study trustworthiness by asking:

> 'Has there been prolonged engagement with the data sources?
> Has there been persistent engagement with emerging issues?
> Have raw data been adequately checked with the sources?
> Has there been significant triangulation of raw data leading to analytical statements?
> Has the working hypothesis, or evaluation, or emerging story, been systematically tested against the analytical statements?
> Has a critical friend thoroughly tried to challenge the findings?
> Is the account of the research sufficiently detailed to give the reader confidence in the findings?
> Does the case record provide an adequate audit trail?'
>
> (Bassey 2004:118)

In the current study construct validity was achieved through the use of multiple sources of evidence such as interviews, course documentation, questionnaires, analysis of interactions with the e-portfolio and of written work over a period of two years. Internal validity in this research relates to the extent to which the association between the data collected and the conclusions reached is warranted. For instance, in establishing the association between the use of the e-portfolio as a pedagogical tool and the development of reflection it was crucial that what was being inferred was actually the case. This was achieved through the adoption of mixed methods enabling the results of quantitative data to be cross checked with qualitative and vice versa. In addition, throughout the design of the methodology it was necessary to achieve a transparency in all aspects of data collection by providing detailed procedures in order to ensure that the reader was confident in the findings. External validity is concerned with whether a study can be generalised and this is considered above, but it is also about sharing the data with colleagues as a means of validating the results from an external perspective. This was achieved through the regular supervisory team meetings and also in the content analysis where colleagues assisted in the checking of data and coding of labels and categories. Yin (2009) also suggests that a commendable case study must be significant, complete, consider alternative perspectives, include significant data and be engaging. This was achieved in this study through the realisation that the study would not be complete by focusing on the interactions on the e-portfolio in relation to context, timeline and feedback as well as the perspectives of the students and tutors as discussed above, but by including a chapter analysing the students' reflective writing. Extending the research activities in the second year gave a more comprehensive understanding of how the e-portfolio was used as a pedagogical tool.

3.3 Mixed methods in case studies

Introduction

The following section expands on the description of the mixed methods adopted within the case study approach and the tools for data collection and analysis.

As noted already, case studies often require data underpinned by different ontological and epistemological assumptions in order to enable the level of detail required to understand the phenomenon under investigation. To collect and collate the level of detail that was required from the investigation of how two cohorts of students, and one cohort of tutors, using different e-portfolio platforms on one course, in one university over a two year period necessitated the adoption of wide-ranging strategies in order to carry out research of this phenomenon (Yin 2003; Newby 201; Johnson & Kristensen 2004; Cohen *et al* 2011). Case studies are often adopted in this situation to make sense of the threads of information from multiple sources of evidence. A mixed method case study approach was adopted for both the pilot and main study providing parallel data collections (Gorard & Taylor 2004; Hicks 2011) to elicit the level of detail required to understand the phenomenon under investigation. In addition, this mixed methods approach is based on the methodological concept of method triangulation as a means for seeking trustworthiness across qualitative, (phenomenological), and quantitative methods, (positivist) (Patton 1990). Yin suggests that the use of multiple sources of evidence enhances what he refers to as 'converging lines of inquiry' (2009:211). This was the driving ambition in relation to this study, to use multiple sources of evidence to enable a holistic understanding of what was happening in the phenomenon at the centre of this study. The inference is that interrogation of multiple sources of evidence through data and method leads to trustworthiness of outcomes. This mixed methods approach can be

described as both interpretative, concerned with the interpretation of evidence and bringing meaning situated within a phenomenological mode of enquiry, and experimental or scientific, adopting a positivist mode of enquiry enabling an objective perspective on evidence. These contrasting paradigms enabled the research to develop a deep understanding of the phenomenon being studied through exploration of reality as perceived by the participants, and my perception as the researcher.

The methods, purpose and adaptations to methodological tools from pilot to main study are as shown in the research design, Table 2.

Phenomenological mode of enquiry

Phenomenology is a philosophical understanding that has implications for the methodology used and research methods within that. The flow of the information assumes an interpretative mode of enquiry (Maykut & Morehouse 1994). By using a phenomenological approach to study the tutors' and students' perceptions of the use of e-portfolios, the current research assumed that there was no one single understanding of perceived reality and that within the groups of tutors and students there would be multiple realities from multiple perspectives. Mutual understanding of what is being disclosed is essential as suggested by Newby, '...interaction between researcher and subject, that produces mutual understanding and agreement' (2010:510).

Positivist mode of enquiry

A positivist mode of enquiry assumes ontological realism, seeing reality through studying its parts, revealing reality through the combination of its parts by the assumption that there is only one truth to be discovered (Newby 2010). The positivist mode of inquiry applied to e-portfolios from direct observation of data, therefore, provided richness of quantitative detail for the study, complementing and enabling development of ideas

shaping the research process (Green, Caracelli & Graham 1997; Bell 2005) and informed statements about what was happening in e-portfolio use. Quantitative data were collected on the activities of the tutors and students to understand frequency of the use of the e-portfolio. It was important in the current study to determine the patterns of what occurred (the incidents), how many times (the frequency), and any association between these variables or sets of variables.

Validity and reliability of mixed methods approaches

The issues concerning validity and reliability of case studies have been discussed in section 3.2, with an exploration of the literature, for instance Yin (2003) and Bassey (2004). As previously discussed validity concerns how the conclusions that are reached accurately represent the phenomenon under study and the evidence that supports the argument presented is complete (Yin 2003). Therefore, the results are considered as trustworthy as the reader has faith in the way the inquiry was undertaken, and as posited by Huberman & Miles (2002) the findings are considered credible due to a well designed research process. However it is worth mentioning some additional points here and to further consider the notions of validity and reliability when applied to mixed methods.

As previously outlined, within my research data were simultaneously collected and analysed, with the findings leading to what Greene, Caracelli and Graham described as 'to measure overlapping but also different facets of the phenomenon yielding an enriched, elaborated understanding (1989:258). The triangulation of these results led to a clear understanding of what was happening with a complementarity of qualitative and quantitative methods leading to '... convergence, corroboration, and correspondence of results across the different method types' (Caracelli & Greene 1993:196). By using mixed methods it was anticipated that there would be confidence in the findings because they captured the multiple perspectives and realities of the case studies. However, this

confidence would only be secured if the research findings were considered as 'valid' and 'reliable', in other words 'trustworthy'. Therefore, it was necessary to explore the concepts of validity and reliability before discussing the pragmatics of ensuring that the mixed methods adopted for this research were considered valid and reliable, as discussed below.

Validity

Creswell and Clark (2007:145) noted that 'the very act of combining qualitative and quantitative approaches raised addition potential validity issues'. These include how validity is conceptualised in mixed methods, whether or not researchers should follow the traditional validity expectations of the different methods, the threat to validity given the different data collection and analysis applied to this data that occurs in mixed methods. Perhaps it is worth considering the views of Tashakkori and Teddlie (2003) who suggest validity in mixed methods is the process of assessing the quality of the findings from both quantitative and qualitative findings, considering all the data collected in the research. However, they consider that validity may have lost its intended meaning due to the plethora of types of validity in quantitative and qualitative research. They put forward the term 'inference quality' rather than validity in the context of mixed methods. This is defined as 'a researcher's construction of the relationships among people, events, and variables as well as his or her construction of respondents' perceptions, behaviour, and feelings and how these relate to each other in coherent and systematic manner' (Tashakkori & Teddlie 2003:692). They go on to suggest the inference quality consists of 'design quality' and 'interpretive rigor' (Tashakkori & Teddlie 2003, 2009). They explain these terms as follows: design quality being concerned with a study adhering to commonly accepted best practices and interpretive rigor, the evaluation of accuracy or authenticity of the conclusion.

However, the concept of validity is a contested concept and as explored by Winter there exists 'no common definition' in relation to quantitative and qualitative research (2000:online). For example, Hammersley puts forward the definition that 'an account is valid or true if it represents accurately those features of the phenomena that it is intended to describe, explain or theorise' (1987:69), whereas Muijs (2004) suggests validity refers to the extent to which the research measures what it intended to measure, therefore does it answer the research question posed. Newby (2010) suggests validity concerns how the results represent the phenomena under study and the evidence that supports the argument presented is complete. In other words, when the research is complete and written up in a report does it accurately represent the issue investigated. Cohen *et al* (2011) comment that by consistently working to achieve the highest degree of validity possible through the transparency of the data collection and analysis, thus through the design of the research, validity will be achieved. Nevertheless, when considering the views of Hammersley (1987), Muijs (2004), Newby (2010) and Cohen *et al* (2011) they appear to be vague in that their explanations and leave many questions unanswered. For example, it is not clear how and when validity is to be applied to research and if so how this discreet element is identified, if researcher's beliefs on what requires validation is a universal belief, and if validity is to be considered as being achieved by reaching the ultimate goal of one hundred percent validity and what this actually means. Perhaps as suggested by Newman, Lim and Pineda, we should use the term 'estimates of validity' as they put forward there is no such thing as exact validity (2013:244). These questions arose when considering my research as I was trying to understand the world of the participants and how I would ensure my understanding and interpretation of data was accurately reported and, therefore, may be considered as valid. Plowright (2011) suggests that this is a debate that has existed since for many years and that 'it is the question of how we come to an

understanding of the world in which we live and whether or not that understanding can be reliable and trustworthy' (2011:2). Perhaps the view put forward by Sapsford and Jupp is more precise than those mentioned above, they define validity as 'the design of research to provide credible conclusions; whether the evidence which the research offers can bear the weight of the interpretation that is put on it' (1996:1), although this definition is more precise it still does not put forward clear characteristics. However, they do argue that what needs to be considered and established is whether data:

> 'Do measure or characterise what the authors claim, and that the interpretations do follow from them. The structure of a piece of research determines the conclusions that can be drawn from it and, most importantly, the conclusions that should not be drawn from it.'
>
> (Sapsford & Judd 1996:1)

The definitions of validity given above may be considered as appropriate when dealing with quantitative research where the data collection is pre-planned and structured in such a way to enable comparisons. For instance, with the adoption of statistical procedures that enhances claims of validity of research findings. Conversely, qualitative data collection is more open ended and flexible, where the researcher is often working with transcripts of verbal data (Maxwell & Lomas 2003:254), and, for instance, where the researcher has no clear indication of what the dialogue between researcher and participant will ultimately reveal. This was the case in my research with the adoption of semi-structured interviews. Kvale (1996) suggest three different criteria for validation of any qualitative research these being validity in the quality of the craftsman, communication and pragmatics. Briefly these refer to how well different pieces of research fit together and correspond to the questions posed, how convincing the research story is to experts in the field and pragmatically how the research has practical impact within the wider community. Hesse-Biber (2011:88) considers that these three criteria 'also apply to qualitative data in mixed

methods'. She goes on to suggest that qualitative data adds a richness of in-depth understanding of a situation by adding the narrative to quantitative data, and by working with mixed methods it gives the researcher a cross-check on the research results, thus adding rigour to the process of data analysis. As suggested by Plowright the concept of validity is treated differently depending on 'which paradigmatic strategy the author is drawing' (2011:134). This would infer that the understanding of validity is dependent on the researchers preferred paradigm.

In conclusion, it is interesting to consider the views of Creswell and Clark who state that validity differs in quantitative and qualitative research, nevertheless 'in both approaches serves the purpose of checking on the quality of the data, the results and the interpretation' (2011:210). They go on to discuss that quantitative research is concerned with the quality of the 'scores' from the research instruments used and the conclusions from the analysis. Whereas for qualitative it is about assessing whether or not the information obtained through the data collection process is accurate.

Reliability

Reliability is concerned with consistency. In pseudo-scientific forms of enquiry this is usually seen as the extent to which procedures would produce similar results under the same conditions on all occasions, and, the research is reliable and, therefore, trustworthy. As already discussed, reliability is concerned with questions of 'stability and consistency and whether [in quantitative work] the same measurement tool can yield stable and consistent results over time' (Wheeldon & Ahlberg 2011:125). Reliability has traditionally been concerned with the positivist mode of enquiry and quantitative data collection and implies that research can be replicated by others, results are consistent and stable, where reliability of 'scores' is established and validity addressed (Cresswell & Clark 2011). Therefore, as commented reliability in quantitative studies may be

considered in terms such as would the same test be replicable and draw the same conclusions if carried out on other occasions. Cresswell and Clark (2011) suggest that reliability has limited meaning in qualitative research, however, unless there is an interest in comparing coding. For instance, in the case of qualitative data, there is the question of whether content analysis of transcribed interviews would yield the same results when coded by other researchers and, therefore, considered to be a reliable interpretation of the data? This was achieved in my research with a colleague verified my coding. However, as Newby (2010) points out qualitative research can also achieve reliability by the researcher remaining objective in the judgements they make and by being aware of the influence of the researcher/participant relationship and the need to remain objective. As Newby explains, 'objectivity means that the researcher is dispassionate in their judgement and, by implication, that another disinterested researcher would reach the same conclusions when faced with the same evidence' (2010:121). This is an important point to consider when engaging in interviews in a longitudinal study as relationships between interviewer and interviewee may develop. In my study this was forefront in my mind when conducting interviews, particularly with tutors with whom I followed for two years. However, even in shorter periods, such as one year of following students with three interviews over the period of one year, it is important that objectivity is maintained in order the conclusions are based on verbatim transcripts rather than presumptions made on what the participant may or may not have been implying.

Reflections on issues of validity and reliability in this research

My understanding of these two terms is that validity is achieved through a transparent and rigorous methodology applied to data collection and the reporting of findings, and that reliability is achieved through the trustworthiness the reader has in the research process, and, therefore, faith in the findings. It was very important in my study that the

methodology adopted for this complex research was comprehensive in order to ensure a systematically rigorous approach to data collection and analysis in order for the reader to view my findings as plausible.

The general agreement of adopting mixed methods should be driven by the research questions, objectives and context of the research (Creswell & Clark 2011; Ridenour & Newman 2008; Teddlie & Taskakkori 2009). In my research this was the case. By using mixed methods with the collection of both quantitative and qualitative data together with a number of different data collection tools, it was possible in this study to cross reference, compare, and verify information through the triangulation of evidence from the multiple sources. This was achieved by the methods, purpose and tools adopted and described in table 2, and discussed in the following sections.

Table 2. Research design: methods, purpose, tools

Method	Purpose	Methodological tool with timeline
Qualitative Questions to be addressed: What are the key factors influencing the implementation of e-portfolios? Is there a relationship between the use of e-portfolios and the develop-ment of reflective learners?	Gathering data from interviews - sample groups of tutors and students collecting data on perceptions relating to research questions. Gather background knowledge and views of key University personnel. Process of quantifying qualitative data by coding, analysing for frequency and comparing data sources.	Semi-structured interviews with tutors and sample of students. Pilot - student interviews carried out in November 2009 and February 2010. Tutor interviews conducted November 2009, February 2010, May 2010 Interviews with key personnel semester one. Main Study – student and tutor interviews November 2010, February, 2011, May 2011
	Analysis of work uploaded to e-portfolio to understand the relationship between e-portfolios and reflective practice.	Pilot and main study – incidents of reflection analysed through manual content analysis using grounded approach. Main study – analysis of work uploaded for Masters element of the course. Depth of reflection analysed through Hatton and Smith (1995) framework.
	Analysis of course documentation for reliability of data gathered from questionnaires and interviews. Understanding the course design and expectations of tutors and students.	Used as 'base line' for clarification of information given by participants. Timetable and timelines used to understand the activities of both tutors and students.
	Analysis of feedback to understand the relationship between feedback and influence on depth of reflection.	Main study – opportunity sample, analysis of work uploaded for Masters Level element of the course.
Quantitative Questions to be addressed: How are e-portfolios used by trainee teachers? Do e-portfolios support Continuing Professional Development?	Questionnaire gaining cohort-wide responses, providing summaries of large amounts of data. Analysis allows for comparison, identification of relationships and generalisations. Quantitative data from a self-assessment using a semantic scale, interpreting across questions to identify common themes. Qualitative data through comments to explain quantitative response.	Questionnaire with ratings and comment boxes circulated to whole cohort. Pilot - student questionnaire trialled with sample of students June 2009. Initial student questionnaire circulated in September 2009, a second student questionnaire distributed in February 2010. Tutor questionnaire distributed in June 2009. Main study – revised student questionnaire circulated September 2010, second questionnaire February 2011. Tutor questionnaire circulated September 2010.
	Analysis of interactions on e-portfolio to discover frequency in relation to contextual information	This was not achieved in pilot. Main study – analysis of e-portfolios from opportunity sample to gain an insight into how many times the students and tutors interacted with the e-portfolio, the context where this took place.
	Analysis of completed 'Themes and Issues' to gather data in relation to frequency of interactions on individual 'Themes and Issues'.	This was not achieved in pilot. Main study – analysis of frequency of activity on 'Themes and Issues' by the student.

3.4 Tools for data collection

As noted above the tools selected for both case studies for data collection were analyses of course documentation, questionnaires, and semi-structured interviews. In addition for the main study, analysis of student/tutor interactions with the e-portfolio together with analysis of reflective writing uploaded to the e-portfolio. The tools together with advantages and disadvantages are described below.

3.4.1 Documentation analysis

Documentation includes 'policy' of the course and gives a perspective of what is expected to be understood by participants. This documentation acts as a reference point with which to compare other results (Burton 2007; Cohen *et al* 2011). One important use of course documentation was the purpose of triangulation. Using course documentation to check the reliability of data from other sources (Bell 2005) and adds valuable insights into the interpretation of documentation by participants.

The main advantage is that documentation is accessible and informative as well as unobtrusive with no need to ask for permission for access, data gathered are reliable, and can be gathered at any time in the research process as it is permanent (Burton 2007; Bell 2005). However, this tool may be time consuming to analyse due to wealth of available material. As they are designed for a specific purpose and designed by course leaders they can prove to be restricting in the information they offer. In this study I investigated the documentation to provide background information to understand the expectations of the course and use of the e-portfolio as a pedagogical tool. This process also provided information on participants' interpretation of the course documentation and to verify statements made by students and tutors.

3.4.2 Questionnaires – tutor and students

Questionnaires are one of the most popular ways of data gathering (Newby 2010). This is due to the advantages of this means of data collection as a large amount of information can be gathered from a wide population, it is an inexpensive tool, provides both factual evidence and opinions from the perspective of the participant, anonymity can be ensured, the researcher has control over the questions posed and therefore directs responses, reduces bias and in most cases is convenient for the respondent (Burton *et al* 2008; Bell 2005; Newby 2010; Walliman 2001).

The disadvantages of this type of data gathering are due to the lack of control of response rates which may be low and may result in bias with regards to representation of population views, they also generate large amounts of data which can be an advantage but do require a great deal of the researcher's time in analysis. The anonymous responses allow for confidentiality but also mean it is not possible to ask for clarification of any points at a later stage and missing data, where the respondent fails to answer all the questions, cannot be retrieved because of the anonymous responses (Burton *et al* 2008; Bell 2005; Newby 2010; Walliman 2001).

Pilot study

Prior to the commencement of the pilot study the initial student questionnaire was piloted with a volunteer group to ensure that the questions were clear, with amendments to wording carried out. The amended questionnaire was then distributed to students at the beginning of the course with a second questionnaire at the halfway point. Following informed consent (Appendix 1), during the first lecture of the course all students attending (ninety students) completed and return the initial questionnaire. This focused on the skills to use the technology, anxiety in using new computer programs, prior

experience of e-portfolios and journal keeping, preference with regards to paper or digital storage and frequency of using email and social networking with comment boxes for additional information the participant wished to add. In addition the questionnaire sought to gain agreement to attend interviews and to complete a further questionnaire. From the initial questionnaire a sample was identified to take part in interviews (see Sampling section 3.5.)

Further reflection on factors influencing the successful implementation of an e-portfolio following the pilot led to a realisation of the importance of the purpose and its introduction being clearly understood (Cotterill *et al* 2004a; Roberts *et al* 2005; Tosh *et al* 2005). Therefore the question 'Do you know why the e-portfolio is being introduced on this course?' which was not used in the pilot, was added in the main study.

The purpose of the second student questionnaire was to probe for further information following interviews with a small sample of students.

The tutor questionnaire explored computer skills, anxiety with new technologies, prior experience of e-portfolios, training needs, purpose, how the e-portfolio was intended to help students learn, and teach. As the sample of tutors remained the same for the pilot and main study tutors were only asked to complete the questionnaire at the beginning of the pilot phase. Examples of questionnaires are given in the appendices (Appendix 2 initial student questionnaire, Appendix 3 student second questionnaire, Appendix 4 tutor questionnaire, Appendix 5 underpinning rationale for questions).

The student questionnaires included a rating scale which was used for the participants to self-assess with a 'semantic differential' giving an opposite adjective at either end (Cohen *et al* 2011:387). It is acknowledged that this may not yield accurate data due to the individual's perception of what each level on the scale actually means and a rating of two for one individual may mean something entirely different to another participant. In

addition qualitative data were collected from a comment box provided against each question for the respondent to explain and clarify their response if they so wished. As Cohen *et al* (2011) suggest a qualitative open-ended questionnaire may be appropriate in a case study as it will capture the perceptions at a given moment in time, and be specific to that moment.

In summary, therefore, the purpose of the questionnaire to students and tutors was to gather data relating to the implementation issues identified in the literature. These were tutor and student confidence and competence with using technology, training needs, together with their perception of the purpose and views on how the e-portfolio will be used to improve the teaching and learning taking place.

Main study

Following informed consent all students who attended the first lecture of the course (one-hundred) were asked to complete the initial questionnaire with the additional question added to ascertain whether or not they understood the purpose for using the e-portfolio. The return rate was seventy-four percent.

As with the pilot study, from the questionnaire returns the sample to attend interviews were selected together with a sample to complete a further questionnaire. A volunteer sample was selected as described in section 3.5.

3.4.3 Interviews

On the questionnaires students and tutors were asked to indicate whether or not they would be prepared to participate in interviews. Thus a sample of students was selected for interview (see section 3.6), all tutors agreed and were invited to attend interviews. Interviews were arranged via email, and questions prepared for the semi-structured interviews. These interviews were digitally recorded and transcribed with the

participants' consent to enable in-depth analysis (interview schedules are included in Appendices 6 and 7). Manual content analysis was carried out and data coded in order to identify key issues and features with inter-coder involvement (see section 3.5). This process of transcription and coding was adopted to limit the issue pointed out by Lichtman (2006:117) who warned research can show bias as it is 'filtered through the researcher's eyes'.

Semi-structured interviews

Semi-structured interviews were adopted. These included a set of predetermined questions which enabled the researcher to cover generic issues raised both from the sample group and from other areas of analysis. It also enabled the participant the opportunity to express perceptions on issues from their own experiences. These interviews are useful when the researcher is not aware of issues that he/she does not know, whereas structured interviews are more appropriate when the researcher is fully aware of the things he/she needs to find out (Cohen *et al* 2011). Semi-structured interviews are a way of ensuring similar content is covered but also leave the interview sufficiently unstructured to remain open for the unforeseen disclosure of information (Lankshear & Knabel 2006). This allows participants to express their views beyond the research question. This type of interview is also referred to as 'guided interview', where the interviewer is able to use a set of questions but vary these according to the demands of the interview (Lichtman 2006). Cohen *et al* (2011) refer to these as unstructured interviews that have to be planned, that the interview is a social encounter and as such it is also possible to gather additional data based on individuals' backgrounds.

The main advantage of interviews is the possibility to collect data that is complete and rich in contextual information due to the ability to probe. Data can be provided from all participants in the sample giving different perspectives. As the interviews are often

conducted in naturally occurring settings with the researcher present a rapport can be established. As well as opportunities for probing questions, time can be given for response enabling complete answers to be gathered (Bell 2005; Newby 2010; Walliman 2001). The disadvantages of this type of data collection is that is can be time consuming, expensive in time for the researcher to attend and also transcribe, it may be difficult to maintain anonymity and both the conduct of the interviews and their interpretation may be influenced by interviewer bias (Cohen *et al* 2011). There is also the issue of students perceiving the interviewer as in a position of power and framing their responses accordingly (Rubin & Rubin 2012).

Pilot study, interview process

From the questionnaire a sample were selected to attend interview (see section 3.6). From the nine invited to interview, six attended. Interviews were conducted one every semester in pre-designated areas, however due to the requirements of the University these arrangements were often changed as the rooms were in use. All interviews were digitally recorded and transcribed. Due to a change in the availability of students during the final planned interview, these did not take place. This was considered in the main study and the final interviews arranged earlier to enable the selection of additional dates if it became necessary to do so. All tutors were interviewed each semester.

Main study, interview process

As a result of the experience in the pilot with the disruption of moving rooms, all rooms were booked in advance. To increase the size of the sample a different sampling technique was adopted (see section 3.6). Interviews took place one each semester with the final interviews being carried out in May to avoid the problems encountered in the pilot.

3.5 Content Analysis

Content analysis was used as a tool for the analysis of interview data and reflective writing. This method provided the structure for replicable systematic analysis of the content. Other methods of analysis such as discourse, narrative and conversation were considered. However, these means of analysis were discounted as the focus for the interviews was not to explore the way language was used, or to identify the skills and strategies used by participants, but to gain an understanding of participants' perceptions which emerged through topics raised, areas of concern, and who said what and when. In addition the purpose of the analysis of the reflective writing was to identify occurrences of reflection. Therefore, content analysis was considered appropriate for both the analysis of interview and reflective writing data as it enabled emerging topics to be classified and counted using an analytical approach based on the researcher's 'interpretation and identification of meaning' (Newby 2010). The process of content analysis for interviews and reflective writing is discussed below.

Interviews

The purpose of the interviews was to gather data on the perceptions of both tutors and students and provided a wealth of information in the form of a dialogue between the participant and me as interviewer. Analysis of these interviews provided both qualitative and quantitative data: qualitative in that it provided a rich source of responses from the perception of the participants on the use of the e-portfolio in supporting learning and also quantitative data to reveal the frequency of incidents and, as an interview with each individual was conducted each semester, comparisons over time. The process of analysis is given below.

Recording and transcribing

As part of the data gathering process individual interviews were conducted with tutors and students. These semi-structured interviews took place in the University and were digitally recorded. This was to ensure that the dialogue was captured and provided assurance that the data collected would be available for what Krippendorff describes as 'recurrent examinations' (2013:126). These interviews were then transcribed verbatim to show a full and accurate account of the responses to the interview questions. These transcripts were checked against the recorded interviews to ensure that they were an accurate record of the interview.

Identification of words and phrases

The text that was produced through the transcriptions was read and re-read. What followed was the highlighting of 'interesting' words and phrases with coding, or labels emerging through this careful re-reading. This initial coding was an attempt at describing the research phenomena through labelling words and phrases providing an insight to what was happening, how often and the participants' perception. This first stage of coding is referred to as open coding (Glaser & Strauss 1967) and is the first attempt to identifying themes and categories (Matthews & Ross 2010). Newby states that the aim of this coding is to 'develop a set of codes that summarises the researcher's assessment of the data' (2010:488). This first stage in the content analysis enabled a broad understanding of participants' responses to the interview questions as well as additional information participants wished to share. These words and phrases were also analysed, where appropriate, to ascertain whether they were negative or positive responses to the issue under discussion. For instance, students might have commented on the scaffolding they received from a tutor by commenting favourably on the frequency of feedback points on their work. This would be coded as a positive frequency of feedback comment. Similar

coding was conducted on all interview data several times, over a period of time. Coded data was compared to other coded data; the purpose of comparing data with data, data with codes, and codes with codes was to identify similarities and differences and led to necessary modifications to coding (Glaser & Strauss, 1967).

Computer software for coding

In the main study the analysis of this content was carried out using NVIVO, a qualitative analysis software package, and verified by a manual check to validate outcomes. The emerging open codes called 'nodes' were then organised under appropriate category headings as an umbrella term for all coding relevant to the category. Employing a software program enables large amounts of data to be manipulated and sorted quickly with the possibility of producing of statistical reports. However, the disadvantages are time taken to learn how to use a new program and accuracy of data input - to be valid it is essential that typing errors are avoided.

Identification of categories

Following the coding of individual units within the text it was necessary to identify common themes by 'clustering' codes in groups. Considering shared attributes and common meaning enabled the emergence of categories. This process is usually achieved by 'semantic definition or by relations within a thesaurus' as suggested by Krippendorff (2013:205). This process was achieved in discussion with the supervisory team and the development of visual representation through the creation of mind-maps. From these mind-maps and clustering of codes the categories began to emerge. The clustering of codes into categories, sometimes referred to as axial coding 'to integrate codes around the axes of central categories' (Ezzy 2002:91) enabled the final stage of coding to develop. The final stage is theoretical coding, which is when the core idea that explains and links all the coding together emerges providing an explanation for coding. Through the final

stage it became apparent that the coded text referred to e-portfolios in different conditions and the categories of 'Academic Conditions', 'Experience', 'Scaffolding', 'System' and 'Technical Conditions' emerged.

Reliability

Reliability is defined as 'the degree of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions' (Hammersley 1992:67). Reliability was initially established through the re-coding of data to demonstrate internal consistency. This is also referred to as 'intra-rater' reliability (Cohen et al 2010). This process of re-reading and checking codes is referred to as 'stability' by Krippendorff (2013) who comments that the purpose is to assess that the process gives the same results on repeated occasions. Although stability is a form of testing for reliability, it is not sufficient if other tests of reliability are not adopted. Therefore, this was followed by replicating the process of inter-rater reliability to determine that the process could be replicated. Replicability measures the extent to which a process can be reproduced by different coders to ascertain the reliability of the process. A colleague who had experience of coding was recruited to act as an additional inter-rater for both case studies. A meeting was arranged to explain the research and research questions as without this information the text may have been meaningless. The coder was given a list of codes and texts and during the coding no further communication took place between us, as it was essential that the coder worked independently. A sample of one student and one tutor interview from the pilot study was supplied for inter-coding; in the main study this was increased to three student interviews and three tutor interviews. The results of my coding and my colleague's coding were compared and level of agreement determined. This means of testing for reliability was through a simple percentage-agreement figure. This is calculated by adding up the number of occurrences

that received the same coding by both coders and dividing that number by the total number of coding by both coders. The percent agreement statistic has several advantages such as it has a strong intuitive appeal, calculation is fairly easy to apply and the process easy to explain (Stemler 2004: online). The comparison indicated a greater than ninety per cent consistency. This would indicate confidence in the coding as 'two raters with high inter-rater reliability could be seen as mutually reliable, concurrent or in agreement' (Gwet 2012:8). This process resulted in confidence in the coding. No codes were missing; this was due in part to the fact that the second coder was advised to ensure that all text was coded. This process of inter-coder reliability relies on the assumption that:

> 'reasonable observers should be able to come to exact agreement about how to apply the various levels of a scoring rubric to the observed behaviours. If two judges come to exact agreement on how to use the rating scale to score behaviours, then the two judges may be said to share a common interpretation of the construct.'
>
> (Stemler 2004:online)

What followed was a professional dialogue concerning the contentious coding, and agreement reached. This process of inter-rater coding does not identify or correct chance agreements, and on reflection the use of a statistical analysis such as Cohen's Kappa, a popular statistical tool in social sciences (Gwet 2012), may have added weight to the conclusion of reliability of coding.

Reflective writing

Content analysis of the reflective writing was adopted to establish the occurrences of reflection. The process followed closely that described above for the interview data including inter-coder reliability. Coding was applied to phrases where the text revealed the student had reflected on a situation, re-read over time and categorised. In addition the writing was code for depth of reflection. This is described in detail in chapter 6.

Grounded theory

'Grounded theory' as applied to this research described the way in which the codes emerged through the systematic approach of transcribing, reading line by line and coding inductively, ensuring rigour was applied to the process. As stated by Charmaz 'grounded theory is an inductive, iterative, interactive, and comparative method geared toward theory construction' (2006:41). In order to make sense of the interview data the researcher relies on the transcripts of interviews but also has knowledge of the context in which the interview took place, therefore, as suggested by Matthews and Ross (2010), grounded theory research starts before analysis of data, and continues in the research setting. This is because the researcher's role is to 'understand the processes that are happening and the ways in which the various actors conduct themselves' (2010:399). As I engaged with the qualitative data that I coded I was consciously aware of understanding the context of some of those data rather than others. For example, as I conducted the interviews myself I understood the context of the transcripts. However when I came to code the reflective writing I had nothing to do with the production of these data and, therefore, found it much more difficult to code the responses in a way that captured the real meaning behind them

Both the pilot and main study followed the same process of coding as described above. However, when coding data in the main study it quickly became apparent that the category headings were the same as those adopted for the pilot, and, therefore, were consistent over the two studies. Therefore the process of coding in the main study cannot be described as applying grounded theory. However, the content coding of sub-themes within these categories was dissimilar between the pilot and main studies. The sub-themes within the pilot study tended to represent more negative views whereas the issues in the sub-themes in the main study were predominately positive. The similarity in

category headings in the pilot and main study may have resulted from the fact that the tutors participating in the pilot remained constant, and although a different set of students the issues explored in interviews centred on similar topics.

3.6 Sampling

All six tutors who taught on the PGCE course agreed to participate in the research, for both studies. A range of sampling techniques and strategies were considered for the students. These techniques and strategies are applied to the whole population, defined as the 'totality of people' (Gray 2004:82).

Non-probability sampling was adopted as this is used when the researcher makes a judgement on what element of the wider population will be included in the sample. Whilst this gives the researcher control over selection this method may increase the possibilities of bias (Henry 1990). Sampling techniques include 'purposive or judgemental sampling' where the researcher makes a judgement on the selection of participants on the basis of particular traits or characteristics, as in the pilot. For the main study volunteer sampling was adopted, where the researcher takes advantage of the goodwill of participants in volunteering though this strategy does not ensure representation across the group (Gray 2004). But it does ensure that all those who are willing to participate are included in the sample.

Pilot study, student sampling

Upon receipt of the questionnaires, results were analysed and a sample selected for further interview. Inclusion in the student group for interview was based on a cross-section of respondents who self-reported by indicating on their questionnaires the level of confidence using technology together with the level of anxiety they felt when faced with something new to learn. The sample was selected to include:

- three students with reported low anxiety and high confidence
- three students with reported high anxiety and low confidence
- three students reporting anxiety and confidence at point three on the scale

McIntyre (2005:105) comments on how this method makes sense 'when a great deal of information is held about the population of interest'.

During the pilot of the nine students selected for the sample to be interviewed, six made appointments to attend. Interviews were carried out three times during the year, one in each semester. The interviews with students were executed as planned though in the final round circumstances prevented a number of these occurring, such that one face to face took place, and two were interviewed via email. Given that thirty-three per cent of the arranged interviews did not take place it was considered prudent in the design of the main study to adopt opportunity sampling.

Main study, student sampling

As stated above, for the main study 'opportunity sampling' was adopted where all who volunteered for inclusion in the interview sample were invited to interview. This is a particularly risky strategy for selecting a sample due to the unpredictability of the situation where the sample may be greater than your available resources in time and money. However, from the pilot it was seen as an appropriate strategy to adopt to ensure that the sample would be sufficiently large to be representative of the group. The profile of the main study group invited to interview can be seen in Table 3; this is different from the profile of the pilot sample, explained above.

Table 3. Comparison of self-report of confidence and anxiety in computer use between sample and full cohort of students from initial questionnaire

Self-assessment grading (1 = low 6 = high)	Level of student confidence				Level of student anxiety			
	Interview sample		Cohort total		Interview sample		Cohort total	
	No. of students	%	No. of students	%	No. of students	%	No. of students	%
1	0	0	0	0	3	17.7	6	8.1
2	2	11.8	2	2.7	3	17.7	19	25.7
3	1	5.9	2	2.7	3	17.7	14	18.9
4	2	11.8	6	8.1	4	23.5	21	28.4
5	7	41.2	32	43.2	4	23.5	14	18.9
6	5	29.4	32	43.2	0	0	0	0
Total number of students	17	100	74	100	17	100	74	100

As Table 3 indicates, in the main study no students who self-assessed with a level of one for anxiety were included in the sample, although in the total cohort there were nine who self-assessed their anxiety at this level. All other self-assessment levels were included in the sample. When comparing the percentages of those included from each question for both the sample and cohort the sample is not a true representation of the group as a whole, but does show that all variations are represented.

3.7 Ethics

Agreement to carry out the research was given by the University Ethics Committee prior to the collection of data. In addition the research also conformed to the British Education Research Association Guidelines (BERA 2004).

Informed consent

Individual informed consent (appendix 1) was obtained from the tutors and students before collection of data commenced. It is the intent and principle of gaining informed consent that all participants should be fully informed before they agree to be involved (Oliver 2003), and have the right to withdraw at any point. The students were informed of the research during a lecture session at the beginning of the course with an opportunity

to ask questions. The opportunity to discuss the research with the participants before they consent to participating is the first step in building up close, trusting relationships necessary for the project to succeed, as a longitudinal study by its nature requires goodwill over a period of time (Cohen, Manion & Morrison 2011). As Cohen *et al* (2011) state, the principle of informed consent is related to participants' rights to freedom and, of course, self-determination. Obtaining this informed consent provides the participant with the four elements of this consent, 'competence, voluntarism, full information and comprehension' (Cohen *et al* 2011:78). As participants in the course both the students and tutors were competent, consent was sought to ensure voluntarism with the understanding that any participant could withdraw from the research at any time and full information was given to the participants so they understood the nature of the research.

Confidentiality and anonymity

By giving informed consent participants agreed in the knowledge and understanding that every endeavour would be made to ensure confidentiality and anonymity, in the context of this investigation. This was extremely important as the students were involved on an assessed course and, therefore, needed to be reassured that they would not be identified in the research. The tutors also needed this assurance as they were working in an environment supporting the students involved in the research and also as part of the wider university community. Confidentiality gave the participant the assurance that they would not be identified directly and that data collected would not be presented in an identifiable form (Bell 2005). Anonymity is a guarantee that no one, including the researcher, would be able to identify which response came from which participant (Sapsford & Abbott 1996). In conducting interviews, transcripts needed to be made in order to analyse the data, and subsequent interviews matched in order to identify changes over time for

individuals. Therefore the records kept required detailed organisational strategies in order to ensure that individuals could not be recognised. A numbering system was used in order to match individuals in progressive interviews and in analysing individuals' work, so that changes over time could be identified. This knowledge was stored as part of the researcher's 'inside' knowledge, but as commented on by Oliver (2003) it will disappear from the researcher's mind over time. Individual participants could not be identified from questionnaire responses as these were anonymous. Therefore, participants were guaranteed anonymity. In the context of this study anonymity is understood by both researcher and participant that the responses would only be used for the purposes of this study that all responses were to be shredded once collated on a master spreadsheet, and, that transcripts would be deleted after data analysis was completed.

Identification of University

In the early stages of the research design, when the study was considered by the University Ethics Committee, it was agreed at the first stage of authorisation that the identity of the research University would not be revealed, thus ensuring it would not be possible for participant tutors to be recognised. Therefore all references to websites have been withheld and the University name and logo removed from documentation.

3.8 Analytical framework

The analytical framework designed to address the research question is as discussed below.

3.8.1 Analysis of course documentation – pilot and main studies

Course documents were analysed in order to clarify the background of the course, tutors' and students' expectations, and the assessment framework for the course

3.8.2 Analysis of questionnaires – pilot and main studies

Questionnaire data were entered into Microsoft Excel, a spreadsheet program, such that it was possible to produce statistical information regarding percentage, range, mode, mean and median. From this it was possible to identify patterns in responses and indicators that may have influenced other variables. The comments given by the respondents gave, in some instances, a context within which it was possible to ascertain 'why this should be so' providing a richness to the numerical data collected.

3.8.3 Analysis of interview – pilot and main studies

The manual content analysis was conducted on transcribed interview data. The emerging codes, also called open codes (Burton *et al* 2008), were then organised under appropriate category headings as an umbrella term for all coding relevant to the category. The systematic approach of transcribing, reading line by line and coding inductively, ensures rigour is applied to the process. In the main study the analysis of this content was carried out using NVIVO, a qualitative analysis software package, and verified by a manual check to validate outcomes, as described in section 3.5. Category headings identified in the pilot were adopted for the main study.

3.8.4 Analysis of interactions – main study

In the pilot it was not possible to determine the interactions due to the design of the e-portfolio. Interactions on the e-portfolio during the main study were manually counted and this numeric data used to determine how often individual students used the e-portfolio, when they carried out the interactions, how they responded to feedback and how many interactions took place for each individual theme. It was possible to identify frequency of interactions, place of interaction, response to feedback, frequency of tutor

feedback, and variance over time, both at an individual level and also for the whole group.

3.8.5 Analysis of reflective writing – main study

During the pilot phase the e-portfolios were not analysed therefore it was not possible to investigate the way in which trainee teachers used the e-portfolio or analyse their reflective writing. The main study addressed this shortcoming and the analysis of e-portfolios was carried out for two distinctive purposes – to investigate the interactions of the tutors and students using the e-portfolio and analysis of written reflections. This was an integral part of the study to answer the research questions 'How are e-portfolios used by trainee teachers?' and 'Is there a relationship between the use of e-portfolios and the development of reflective learners?' The interactions are explored in Chapter 5 and analysis of reflective writing in Chapter 6.

As explained, this element of the research was carried out during the second year of research, the main study, case study two. A content analysis carried out on the reflective writing uploaded to the e-portfolio was used as a basis for defining themes of reflection. From this a category framework of reflection, using a grounded approach, was identified with regards to the development of reflective thinking. The categories that emerged were 'Personal Philosophy', 'School Practice', 'What the Literature Says', 'Development of Thinking' and 'Reflection on Reading'. However, the content analysis did not give the depth of reflection and only indicated the point in the course at which reflection took place in each category. The course documentation included a taxonomy for reflection, however due to the complexity of the statements within the hierarchy of reflection this proved problematic to apply to the students' work (see Appendix 8). Therefore, in order to identify both the category that had emerged from the content analysis and the depth of reflection, the Hatton and Smith framework of reflection was adopted (Appendix 9).

Hatton and Smith (1995) argue that reflection is an active and deliberative cognitive process; it takes into consideration many aspects of the individuals' experience and is influenced by context. The Hatton and Smith research on reflection in teacher education explored reflection in different contexts and from the result of different types of stimulus to improve the depth of reflection. Hatton and Smith (1995) explored the notion of development of reflection over time, and developed a tool that identified different qualities of reflection by classifying four different types of writing. These are 'descriptive writing', 'descriptive reflection', 'dialogic reflection' and 'critical reflection'.

I considered this an appropriate framework to use in this study for two reasons. Firstly, the framework has been tried and tested with trainee teachers evaluating the depth of reflection taking place on work relating to the professional practice of teachers, and presents a simpler framework of reflection which aligns with the taxonomy for assessing reflection that was issued to students at the beginning of the course. Secondly, from a personal point of view it also reflects my own understanding of the development of teachers' professionalism. Teaching is not a science, a formula that can be adopted and delivered in the classroom, but an art that is developed over time through reflecting on practice. It is my own personal belief that the process of reflecting evolves from one perspective to multiple perspectives as experience grows, encompassing breadth as well as depth of reflection and experience. It is by reflecting in this wider content that according to Luttenberg determines the '...breadth of the reflection' (2008:544). Thirdly, the expectation from the course documentation was that the students' reflective writing would develop over time as a result of experience of teaching in the classroom, and from the knowledge and understanding of these 'Themes and Issues' through lectures and reading and this process would be supported from interaction with the tutor. It was anticipated that this would enable the student to see the issues being investigated from their experiences from multiple perspectives as a result of their training over time, and as

such increasing the depth of reflection. Hatton and Smith (1995) discovered from the application of the descriptors that trainee teachers were able to learn how to be reflective over time, and, importantly, that verbal interaction with 'trusted others' encouraged them to reflect at a deeper level.

From the analysis of this data it was, therefore, possible to identify frequency of interactions, category of interaction, response to feedback, frequency of tutor feedback, and variance over time, both at an individual level and also for the whole group.

3.8.6 Focus of study

Course tutors decided that they would not continue with the e-portfolio adopted during the pilot, but would use a different bespoke e-portfolio during the main study. Therefore, as the e-portfolio in the main study would not be available after the students left the course it was not possible to gather information regarding how the e-portfolio supported continuing professional development. However, it would be possible to ask during the final interview whether or not students would have liked to have had the opportunity for access at the end of the course. As a result of this change in e-portfolios, the research question 'Do e-portfolios support continuing professional development?' was omitted from the main study.

Chapter four: Findings from pilot phase

4.1 Introduction

The pilot phase of the research was designed as a feasibility study to test out the research tools as a case study to understand how the e-portfolio (PebblePad) was used as a pedagogical tool. Therefore, the aims of the pilot research were to,

- investigate the use of e-portfolios within initial teacher training from the trainee's and tutor's perspective
- explore the issues that influenced the successful implementation of an e-portfolio by exploring the perspectives of the students and tutors using the e-portfolio to support the development of reflection
- identify how the issues raised can be exploited to improve the quality of training provision
- investigate how the e-portfolio was used by the students in the development of their reflective practice and how they were supported in this process by the more informed other, the tutor
- provide data on the factors to be investigated further

Research suggests that one of the main strengths of using e-portfolios was that they can support the learning process by providing an accessible and easily portable repository for the storage of files, replacing the traditional bulky paper-based portfolios (Gaitan *et al* 2007, Sutherland, Beetham 2005, Stefani *et al* 2007). In addition by providing an on-line storage space, the e-portfolios may be used to provide an opportunity for trainee teachers

to develop as reflective learners (Young 2008). However, the findings from this research found students reported confusion of what it was they needed to do in order to fulfil the requirements of the e-portfolio, and what was described by students and tutors as 'overwhelming' expectations in respect of workload. Other issues that were identified through analysis concerned support, design, issues with system, training, ownership, equality of provision with regards feedback, together with the effectiveness of the e-portfolio as a pedagogical tool. In addition, tutors felt the problems encountered were due to the inflexibility of the e-portfolio tool which prevented them from achieving their aims and as a result of this perceived problem the decision was made to discontinue use of this particular e-portfolio at the end of the year. The way the analysis of this data was conducted was influenced by Gaitan (2012).

I anticipated that the implementation would be a smooth process with regards to acceptance of the technology as there appeared to be strong management support, technical support through the University infrastructure, and tutors enthusiastic. However, what I found was negativity from the participants and I felt perplexed by my findings. This led to the deep examination suggested by Archer (2010), Bolton (2010) and Finlay (2002) of why I felt disturbed by the responses, leading to the realisation that my feelings were due to my personal beliefs regarding the potential efficacy of digital technology, which was being challenged by my findings, in particular as they related to the use of e-portfolios that I had recently introduced on my own course. Analysis of the findings from this case study gave me the opportunity to evaluate and review my own position on my own course.

PebblePad

An interview with the co-author of PebblePad confirmed that when designing the system they were aiming for a scaffolding approach, social constructivism, and this underpins the

use of the e-portfolio at different levels whether the scaffold is from internal dialogue when using a form, from peers when sharing, or from tutors. However, it is a system that is not designed for one purpose but gives the user:

> 'The ability to make multiple portfolios and record evidence, to record everything whether they are related to your course, volunteering, or hobbies, the system doesn't care'
>
> (Sutherland 2010:Skype interview)

This may be the challenge that universities need to resolve when taking a commercial resource and adapting for a specific purpose as on this course. As discussed by the co-author those decisions regarding how PebblePad is to be used to support the course need to be explored during the planning stage; it is not a case of just transferring what you did on paper and that the usual approach is to adopt the tool for a particular aspect of the course then build on that in subsequent years:

> 'I think this is where the disruptive nature of PebblePad comes in that it becomes less successful if you don't change the underlying approaches that you had and all you are trying to do is substitute a paper portfolio with a digital portfolio at its simplest level that might be that you only ask to see the digital portfolio two or three times a year because that is all you asked to see the paper portfolio but that is when you get all the problems you used to get that students build on mistakes, errors or misconceptions over time as they did with the paper portfolio because the tutor didn't see them often enough to provide expert guidance or support but with a digital portfolio can be dipped into at any time by a tutor, mentor, subject specialist at any time, providing a circle of support for the learner.'
>
> (Sutherland 2010:Skype interview)

4.2 Analysis of data

The data analysed in this section gives the student and tutor perspectives of working with PebblePad for the duration of the one year PGCE course. The data were collected in a number of ways, and will be reported and analysed in the following order:-

- Initial student questionnaires circulated in September 2009

- Second student questionnaire distributed in February 2010
- Student interviews carried out each semester November 2009, February and June 2010
- Tutor questionnaire distributed in June 2009
- Tutor interviews carried out each semester November 2009, February and June 2010

Data in the transcripts were interrogated and manually coded as previously described. The topics arose from the content, giving a comprehensive list of category codes. The five main categories into which interview data have been coded are: 'Academic Conditions', 'Technical Conditions', 'System', 'Scaffolding', and 'Experience'. These categories are defined as follows:-

- 'Academic Conditions' – the identified issues concerned with the structure and content of the course
- 'Technical Conditions' – issues referring to the technical conditions that may have been prevalent at University level
- 'System' – issues relating directly to the design and operability of the system used
- 'Scaffolding' – comments directly related to the way in which the learning was scaffolded by the more informed other, in all cases the tutor
- 'Experience' – those issues that became apparent from the users experience of using the system

4.2.1 Analysis of student data

Student data were collected through the two questionnaires and three interviews, one each semester.

4.2.1.1 Initial student questionnaire

The initial student questionnaire was distributed at the end of September 2009 to ninety students enrolled on the course (Appendix 2). At this point the students had been in University for two weeks induction. A one hundred percent return rate was achieved with all questionnaires included in the analysis. This was an unexpected return rate. Students were invited to return the questionnaires. There was no pressure to do so, therefore, it was difficult to understand why they all decided to participate. On reflection it may have been a result of the process for return which was relatively easy for them. They were able to leave the completed questionnaires in a box in the entrance of the building in which they were studying.

Confidence in prior use of ICT

Analysis of the data indicated that the students self-assessed overall as being confident users of ICT, although they did feel a degree of anxiety when presented with new programs (Table 4). Given that the majority of students had not used e-portfolios before joining the course it would not be unreasonable to suggest that the success or otherwise of the introduction of e-learning on this course hinged on the successful training of the individuals. As explored by Studler and Wetzel (2005) prior knowledge has an impact on successful implementation as students understand the process.

Table 4. Students' responses to initial questionnaire on issues of confidence and anxiety associated with the use of ICT

Scale	Confidence		Anxiety	
	Freq	%	Freq	%
1	0	0	6	6.7
2	3	3.3	13	14.4
3	5	5.6	10	11.1
4	21	23.3	30	33.3
5	37	41.1	23	25.6
6	24	26.7	8	8.9
Total	90	100.0	90	100.0

The average score from respondents on how confident they felt using a computer was 4.82, with sixty-eight per cent recording a score of five or above, only nine per cent scored three or below. From the comments most people stated that they had based their score on prior experience of using computers. Along with this the average score for anxiety when presented with new computer programs was 3.83 with just below thirty-five per cent scoring this question as five or above, that is a high level of anxiety. Thirty-two per cent scored this question as three or below with the highest response rate being recorded on four (thirty-three per cent). From these figures it is clear that, although the average confidence is high with computer use, new programs do cause anxiety for the majority of students. The comments given revealed that anxiety was based on the amount of training given. If it was perceived that adequate training was on offer then anxiety levels would be less. Given that ninety-two per cent of the respondents had not used e-portfolios before joining the course it is not unreasonable to assume that these two factors together may be an indication that for a high proportion of these students learning a new software program would cause a degree of anxiety on this course. This is compounded by the fact that seventy-eight per cent of respondents had no experience of keeping a reflective journal, either on paper or in an electronic form, and whilst sixty-one per cent preferred to keep paper records, eighteen percent preferred electronic and twenty-one per cent liked to keep both (Table 5). From those who preferred to keep both types of records

the most frequent comment given to explain this was a fear of computer/device failure. I would suggest that an audit of experience and training needs may have highlighted potential issues with tutors being in a better position to provide support.

Table 5. Students' responses to initial questionnaires on issues of prior e-portfolio use, preference to paper or electronic storage, prior use of reflective journal/diary

Response	Prior e-portfolio use		Prior use of reflective journal/diary		Preference					
					Paper		Electronic		Both	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Yes	7	7.8	19	21.1	55	61.1	16	17.8	19	21.1
No	83	92.2	71	78.9	0	0	0	0	0	0
Total	90	100.0	90	100.0	55	61.1	16	17.8	19	21.1

Routine use of electronic communication

Eighty-seven per cent of the respondents indicated that they used email every day, with only one person saying they hardly ever used this method of communication, over half (fifty-six per cent) used social networking sites everyday with twenty-four per cent using them weekly and twenty per cent hardly ever or never using this system of keeping in touch with others (Table 6).

Table 6. Students' responses to initial questionnaire on frequency of using email and social networking

	Everyday		Weekly		Hardly Ever		Never		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Email	78	86.7	11	12.2	1	1.1	0	0	90	100.0
Social Networking	50	55.6	22	24.4	11	12.2	7	7.8	90	100.0

Therefore, the majority of students used the internet for asynchronous communication as well as synchronous interaction. From the data it may be concluded that for the vast majority of students on this course communication using the internet was a system routinely adopted every day. It is not evident from the questionnaires whether students adopted this way of communication out of preference or necessity.

Selection of sample

From the ninety respondents twenty-one agreed to take part in interviews, of these a sample of nine was chosen giving a spread of student replies to questions one and two. Of these nine only six chose to take part in interviews.

4.2.1.2 Second student questionnaire

From the initial questionnaire forty-nine respondents agreed to complete a further questionnaire (Appendix 3), however, only thirty-four gave sufficient contact details. These respondents were sent a second questionnaire via email. Thirteen responses were received, giving a response rate of thirty-eight percent. I felt that the return rate was disappointing but may have been a result of the way in which the students were asked to respond to the request. This was achieved through emailing the student with the questionnaire as an attachment. It required the student to print off the form and leave the completed form in the box in the building where they were studying. This process was necessary to ensure confidentiality. Had the second questionnaires been circulated during a training session whilst the students were in University this may have resulted in other students and tutors knowing they were participating. The questions asked were directly related to the issues raised in the first round of student interviews. The questionnaire revealed that these participants all felt they had the necessary skills to use the e-portfolio. Students were asked to add comments to explain their response to the questions. The outcomes of the second questionnaire, with discussion of comments, are set out as subsets below.

E-portfolio consistency of use

This questionnaire was completed during the seventh week of the second semester. At this point it would appear that the majority of students felt that the training they had

received was not sufficient for their needs and only 30.7 per cent considered that the support offered was sufficient. It was interesting to discover that only one respondent used PebblePad whilst out on placement in school. Whilst on placement the students were working with guidance from a mentor, a member of staff employed by a school, as opposed to working with their peers and tutors whilst in University. All the other respondents stated that they only used PebblePad when in University, this agrees with interview data. Interestingly this result contradicts the intention of the module as outlined in the Reflective Practitioner Handbook for the PGCE course, (Appendix 22) where it is stated that the reflective journal webfolio serves a distinct function:

> 'It provides a medium through which you can summarise your observations, questions, learning and reflections as the course progresses. It is a record of your interaction with the learning opportunities which the course offers and will be assessed at Masters Level along the continuum.'
>
> (Primary PGCE Primary Professional Development Profile –Reflective Practitioner 2009-10:1112)

The guidance goes on to state that 'it is essential that this journal is kept up to date and used weekly' (2009:3). The reference to the journal was confusing for the students, as they were asked to keep an e-portfolio (PebblePad), use a tool on the e-portfolio to create a webfolio, but did not record their reflections as a journal. This would indicate although the intention was that the e-portfolio would be used as an ongoing method of recording their learning experience, as a journal, in reality this did not occur for the majority of students engaging with the research.

Training and support

All felt they had the necessary skills to use PebblePad (one hundred per cent) but 61.35 per cent felt they needed additional training (Table 7).

[12] The identity of the participating University has been withheld for the sake of confidentiality with due regard to ethical considerations.

Table 7. Students' responses to the second questionnaire regarding having adequate skills to use PebblePad, access to technical support and having received adequate training

Response	Skills		Technical Support		Training	
	Freq	%	Freq	%	Freq	%
Yes	13	100.0	4	30.8	8	61.4
No	0	0	7	53.9	5	38.5
Don't Know	0	0	2	15.4	0	0
Total	13	100.0	13	100.1	13	99.9

Young (2008) suggested that those with limited technological skills are disadvantaged when using e-portfolios. This is not the case for these students but they still perceived they needed additional training. The comments on the questionnaire regarding IT skills focused on their experiences such as:

> "Ok except difficulty uploading things and linking from the evidence tree"
>
> "I consider myself to be competent and fairly technologically minded, but I can image that if I was not so adept PebblePad could be potentially very taxing!"

With regards to the IT support to use PebblePad 53.8 per cent felt they did not have sufficient support, 30.8 per cent said they did and 13.3 per cent did not know. They were asked if, now they had used PebblePad, they understood why it was being used. Ten (seventy-seven per cent) said they did understand and three (twenty-three per cent) said they did not. When analysing a small return there is a need to be cautious. Although responses indicated that from students' perspective they had the necessary IT skills, and had two feedbacks through PebblePad. They considered they did not have access to technical support or understand why the e-portfolio was being used but did need further training. The hours spent on PebblePad varied enormously (Table 8).

Respondents were given the opportunity to comment on all their answers, however, questions five, six and seven created the more comprehensive comments. From the twenty comments on these particular questions, three referred directly to technical issues experienced during use and seventeen referred to their experiences studying on the course with the overwhelming nature of the workload, the need for more training in order for

them to achieve the course expectations and questioning the value of using Pebbelpad rather than Microsoft Word.

Table 8. Time spent by students on PebblePad

Number of hours	Freq	% of students
1 to 2	2	15.4
3 to 4	4	30.8
5 to 6	1	7.7
10	1	7.7
12	2	15.4
Too many	1	7.7
Varies	1	7.7
Very little	1	7.7
Total	13	100.1

With regards to the hours spent on PebblePad the comments focused on time spent using the system, as follows:

> "a lot of time is spent uploading documents to PebblePad rather than actually reflecting on my practice"
>
> "I am spending a lot of time working on Word and just copy and pasting into PebblePad rather than working directly into it as my internet connection isn't great, so it sometimes fails and I lose work"
>
> "whilst on placement there is very little time to do the reading and thinking necessary to make a successful attempt at writing in PebblePad, as well as dedicating adequate time to lesson planning and Uni 'Tasks' which have to be completed in school"

Purpose

Question six explored the reason for using PebblePad. Ten said they understood the purpose and three did not. The comments in this section focused on technical difficulties and changes in course expectations inferring the purpose was not understood. The students used the comment box to express opinions regarding the purpose but many other issues they were experiencing such as technical issues, some of which had not been solved at the time of the questionnaire, uploading files to PebblePad as the process was

described as too slow, and opinions with regards to the adoption of the e-portfolio were as follows:

> "Whether or not it was the most effective way of demonstrating that they are reflective practitioners",
>
> "Maybe using it as an option rather than forcing people to use it",
>
> "Training for content is an issue",
>
> "Is there an easier version somewhere",
>
> "Discrepancies between tutors with regard to amount of regularity of feedback"
>
> "System is undermined by changes made to the course"
>
> "Don't really see how it is better than giving in a Word document."
>
> "I understand why it is being used but I do not agree that it is the most effective way of demonstrating that I am a reflective practitioner."
>
> "I know it is to save on the amount of paper copies of things"
>
> "I'm okay using it"
>
> "I understand the principle and I like the idea of it as a tool to enhance CPD, I personally find the timing practicalities quite unrealistic."
>
> "I do, it is a lot easier than paperwork. However it is not an easy format to work with"

Some comments reflected a negative attitude to the use of the e-portfolio due to technical difficulties but most pointed to the negative experience of using it for the course.

The responses from this questionnaire mirror the data collected from the student interviews, to be discussed later, and suggest that there is some commonality in student concerns throughout the student population taking part in the research. Although it may be argued that those taking part may have had 'an axe to grind' and the data collected may have a bias towards those who experienced difficulties, and those who were satisfied with the systems in place did not feel the need to participate in the research. Furthermore it is not appropriate to generalise when dealing with thirteen responses out of a total

population of ninety, however, these responses do concur with the responses from those interviewed.

Feedback

The issue of feedback featured highly during the interviews with this being one of the main issues raised. Comments in interview concerned frequency, method and equality across the student groups. From the results of the multiple choice question on the questionnaire it was discovered that all had received feedback through PebblePad by this stage, with 84.6 per cent receiving two feedback comments (Table 9). All feedback had been given through Pebblepad rather than any other mode.

Table 9. Frequency and mode of feedback

Number of feedback points	No of students	%
One	1	7.7
Two	11	84.6
Three	0	0
Four	0	0
Five	0	0
More	1	7.7
Total	13	100.0

4.2.1.3 Analysis of student interviews

Individual student interviews with the sample of six participants were carried out at the end of November 2009, February 2010 and planned for late June 2010, (interview schedule Appendix 6). The interviews took place in various locations in the University building, where space was available. This resulted in each round of interviews being conducted in a different place and, in some cases, having to move at short notice due to the requirements of University tutors. As a result of the uncertainty of available space students were occasionally given short notice of room changes. This remained an issue

until the final planned interviews when it was discovered that as a PhD student I was able to book rooms.

In addition to the planned interviews, the trainees were asked to share their e-portfolios with the researcher; this was arranged by four of the students who decided they wanted to do this as a whole group in May 2010. A meeting was held with the four trainees in a computer suite and they all displayed their webfolio. All four explained the way in which they had constructed the webfolio, described the process and commented on the end product. The meeting was transcribed and gave an indication of the issues the students perceived as important at this stage of the training course. All trainees were proud to share their e-portfolios and all felt that despite the problems they had produced a comprehensive webfolio of evidence and reflections at Masters Level. The interviews scheduled in June were not conducted as planned. One interview was conducted as arranged; the other five were cancelled at late notice due to unforeseen circumstances. As the interviews were arranged for the last day the students would be in University it was not possible to re-arrange, therefore they were asked to complete the interview schedule by email. Two students responded. On reflection I could see that this was avoidable by moving the final interview to an earlier point in the final term, this change was implemented in the main study.

Content analysis

Content analysis was the method used to code and analyse the data from the interviews. Interrogation of the data gave the main key words and phrases for each set of interview. Although many of the issues discussed within the interviews remained constant, there were particular issues that the students discussed at different times during the course of the research. Therefore topical aspects of their experience were discussed at different points. The coding was then organised into five category headings (as discussed earlier)

of 'Academic Conditions', 'System', 'Scaffolding' 'Technical Conditions', and 'Experience of Using'. The coding under each category revealed a number of issues that were different across the three interviews (table 10). The frequency with which these issues were raised across the three interviews can be seen in Appendix10.

Table 10. Issues within each category at three points in the course in three student interviews

	Issues		
Categories	**1st Interview**	**2nd Interview**	**3rd Interview**
Academic Conditions	Expectations of Course	Mentors do not use PP	Course Changes Confusing
	Workload/Time	Safeguarding Children	PP overwhelming
	Integral Part of Course	Duplication of Records	Lack of time due to workload
	Examples needed	Course Changes Confusing	
	Deadlines	Paperwork not on PP	
	Information Overload	Lack of time due to workload	
		Use exemplars	
System	Reliability	No comments	No comments
	Accessibility		
Scaffolding	Tutor Experience	Tutor Expertise	Tutor Expertise
	Feedback	Feedback	Feedback
Technical Conditions	Not easy to use	Technical Conditions	
	Priority/Add on	Training/Support	Training/Support
	Familiarisation	Uploading	Uploading
	Confusion		
	Preference to Paper		
	Confidence		
Experience	Not used collaboratively	Not used collaboratively	Reflection
	Use email in preference to PebblePad	Use email in preference to PebblePad	ICT a barrier
	Not fit for purpose	Not fit for purpose	Useful to link experiences
	Only working to deadline	Only working to deadline	Didn't use in placement
	Doesn't model good practice	Doesn't model good practice	Will not use after training
	Not integral only showcasing	Not integral only showcasing	
	Didn't use in placement	Didn't use in placement	
	Will not use after training		

Analysis of issues in categories

The following sections give an analysis of the frequency of coding in the categories 'Academic Conditions', 'System', 'Scaffolding' ,'Technical Conditions', and 'Experience of Using' in the five sections for the three interviews. The content analysis identified both positive and negative comments for each category. The frequency is shown as positive and negative coding as a percentage of total coding for the interview. In the first interview 218 phrases were coded, in the second 225 phrases and in the third interview sixty-five phrases coded.

'Academic Conditions'

For 'Academic Conditions' the percentages of total coding for the interviews are shown below.

- First interview – positive comments 1.4 per cent, negative comments 31.6 percent
- Second Interview – positive comments 0 per cent, negative comments 44.0 per cent
- Third interview – positive comments 0 percent, negative comments 36.9 per cent

The issues in this group referred to the actual conditions of the course and accounted for the greatest number of references from the students. The students were not clear about how to use PebblePad for the purpose of reflection, or type of evidence to collect and they were overwhelmed by what they were seeing on PebblePad. One student stated:

> "You have twenty-six sections in it, it is overwhelming there is a lot of sections, it isn't just ten areas to fill in, there is a lot of it and for some people I image it would be 'I can't possibly complete this', you will probably cover all the topics, but having them there is putting a lot of pressure on people."

By the second interview the students had been made aware of course changes and this was an issue they discussed, along with paperwork not on PebblePad, and duplication of records. During the third round the 12.3 per cent of responses (all negative) referred back to the expectations of the course and concluded that this had been a major problem for students. This indicated that at the end of the course the respondents felt that the course changes had a negative effect on their ability to complete the work. One student commented:

> "We were never clear about what was expected and lots of Chinese whispers then started to begin causing more panic and unease"

Within the category 'Academic Conditions' the issues raised most frequently (see Appendix 10) were expectations, workload and time, as discussed below.

Expectations

Although a high number of responses, these did not refer directly to the use of the technology on the course or the way in which it was used to support the course but what they were expected to do on PebblePad. These responses referred to not knowing the expectations of the course due to the perceived differences in responses from tutors. From the total category coding for the first interview 16.5 per cent related to not understanding course expectations with only one positive comment. This, considered with the comments on feedback, confirmed the level of anxiety felt by the students on the assessment taking place.

By the second round of interviews the issue of expectations (9.2 per cent of coding within this category for the second interview, all negative) focused on the confusion regarding course changes. All students were informed in January of the course changes with regards to the areas on the reflective journal that had to be at Masters Level. Originally all areas (twenty-seven) were expected to be completed at Masters Level, but when it was

discovered that this was not a realistic expectation this was reduced to five at Masters Level and the other areas to be completed at Professional Level (first degree level). They were given a list of titles from the following web-folio that were considered suitable for Masters work and told that the remainder needed to be completed at Professional level as follows:

> 'Following your feedback, and as reflective practitioners ourselves, we have acknowledged that the number of areas in the Reflective Journal on PebblePad can feel overwhelming. Therefore, we have identified the following 10 areas as having the most potential for 'Masters' level work:
>
> Behaviour Management
> Classroom Management and Organisation
> Differentiation and Personalisation
> Progression and Transition
> Learning and Teaching Maths
> Learning and Teaching English
> Assessment for Learning and Assessing Pupil's Progress
> Teaching and Learning (here you may wish to consider aspects of your specialism, i.e. Challenging Schools, Early Years, Primary Languages
> Inclusion, Equal Opportunities and Diversity
> Learning Styles, Thinking Styles and Encouraging Creativity
>
> Whilst we still expect you to reflect in all areas we are only expecting M-level content in the 5 that you choose, with an approximate word count of between 1000 and 2000 in each of the 5 you have chosen.
>
> The 10 areas we highlight here should be regarded as a guide, but you may wish to explore any other area at M-level.
>
> In total you must have covered 5 areas at M-level and all other areas at Professional Level.'
>
> (Revised guidance on the Reflective Journal in PebblePad:January 2010)

This did not appear to have reduced the anxiety. As one student commented:

> "I don't know if you knew but since I last spoke to you they are actually expecting us to, well originally the whole of the journal was supposed to be at Masters Level and now they feel from our feedback that is too much and they are only expecting five areas at Masters Level."

However, although this was reported as "Taking the pressure off" it did cause concern for some, as follows:

> "For those people who have started to write a lot it is a bit of a kick in the teeth because people have been writing all twenty-eight sections and they thought that was at Masters level and now told only five it is a waste of time, and I have done more in-depth on those ten that we were told about."

and

> "They (*tutors)* are saying only five sections need to be at M level so that's really good, but still some confusion about it to be honest."

Another student stated:

> "I haven't spoken to one person yet who knows what they are supposed to be doing with PebblePad."

The lack of clear understanding of the task persisted throughout the interviews (12.3 per cent of comments in this category for the third interview) with students commenting that they did not understand what they needed to do to pass the assessment, and would like to be:

> "Told how to achieve a pass".

The screenshot of the Webfolio as it appeared on PebblePad shows the detailed links to different areas of the e-portfolio in the left-hand pane (Figure 1). The reference to keeping a 'journal', as previous stated caused confusion as what it meant was keeping an 'e-portfolio'.

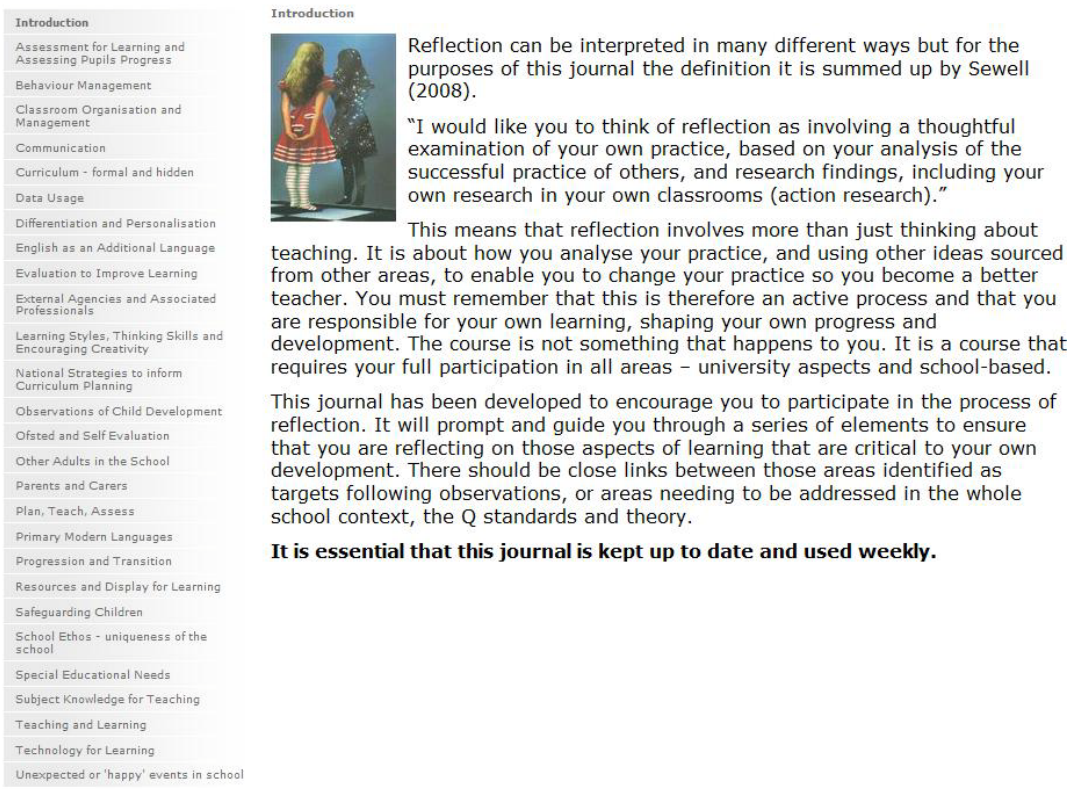


Figure 1 – Screenshot of Webfolio on PebblePad

Workload and time

Workload and time were a recurring theme throughout the data collection process (first interview 11.5 per cent of coding in this category, second interview 13.8 per cent and third interview 15.4 per cent all but one comment in the first interview were negative). The perception of the students was that PebblePad was the cause of the problem because of the length of time taken learning how to use the tool, time taken to upload documents and technical issues that took time to resolve. Students were required to upload evidence to PebblePad to show they had reached the required level of competency against the QTS Standards as well as uploading documents to support their reflections. This required all students on the course to have access to a scanner and involved them scanning numerous documents and uploading. All students interviewed had purchased a scanner during the

first term, as advised during course induction. Their early experience of the process had revealed the length of time this procedure took, given that a proportion of paperwork they handled was not in a digital form. This aspect became more prevalent during the second round of interviews when they realised the scanners they had purchased were not suitable for the volume of work, and, the paperwork they were expected to use was not on PebblePad as a resource. According to all students interviewed, Mentors did not use PebblePad and this meant a duplication of records. The students reported that whilst in school they were expected to have a School Experience file (paper) and the paperwork they used although initially produced in a digital form, needed to be printed for the School File and then annotated following evaluation and then, if using for evidence, scanned and uploaded to PebblePad. As one student commented:

> "We have to upload evidence to our Q standards, three pieces of evidence onto thirty-three standards, ninety-six uploads altogether, it took me three and a half hours to upload three pieces of evidence yesterday."

A significant number of comments referred to paperwork not being available on PebblePad, although it was in a digital form on the VLE. At the time PebblePad was not part of the University VLE. If the students needed paperwork whilst using PebblePad, they had to log on to the VLE and download it. All students felt that everything should be in one place, having two systems running parallel meant they had to learn how to operate two systems. This was not helped by the fact that the students had two different passwords for the two systems; this was changed at the beginning of the next academic year to one common login for both systems. This added another layer to the procedure that they perceived as multi-layered. When referring to paperwork and duplication one student commented on copies she had:

> "One for my Standards and one copy in my school experience file that I need, I have had to photocopy one for the Maths and English task files which are separate files, the same lesson observation twice there, and then scan all of that into PebblePad for my Standards, so same bit of paper being split three ways if that

> makes sense which is annoying because I thought the idea of PebblePad was that you didn't have all this paper you pushed, but I don't think it would work if everything went electronic either!"

There is a sense from the content analysis that the students' understood PebblePad to be the central place where they were expected to be working, yet the resources were elsewhere. During the second interview 12.8 percent of comments referred to paperwork not available on the e-portfolio. In order to get the information to PebblePad they were scanning and/or uploading, then printing/photocopying as they were expected to maintain paper files. This duplication of information necessary for those assessing them, the University tutors assessing the e-portfolio and school mentors the paper file. As one student confessed when referring to her lack of engagement with PebblePad:

> "I am putting it off in case they do a U turn and let us hand in folders".

At the end of the research during the final interview, when students were reflecting on their experiences, workload and time was the most frequent topic in the academic conditions category (15.4 per cent). In addition, by this point in the course 9.2 per cent of comments during interview three concerned the e-portfolio being overwhelming. When referring to the webfolio in PebblePad one student stated:

> "At present with all sections and compulsory 'Tasks' was overwhelming for the student considering all other aspects of the course"

'Technical Conditions'

For 'Technical Conditions' the percentages of total coding for the interviews are shown below.

- First interview – positive comments 4.1 per cent, negative comments 20.2 per cent
- Second interview – positive comments 0 per cent, negative comments 13.3 per cent

- Third interview – positive comments 0 per cent, negative comments 20.0 per cent

This category included the comments concerned with the technical aspects of working with PebblePad. This covered the students' view on the skills they felt they had in order to use the tool effectively, the support they received from the more informed others at the University, the training provided during the course and any particular problems they encountered.

Within the category 'Technical Conditions' the issues raised most frequently were skills, support and training (see Appendix 10) as discussed below.

Skills, support and training

All interviewees commented on the lack of skills and support in using PebblePad, (first interview 18.8 per cent of coding in this category, 14.7 per cent negative, and third interview 13.8 per cent, all negative). This may be directly related to the dissatisfaction with feedback, discussed in 'Scaffolding' below. When discussing the number of training sessions they had received, responses varied, some reporting one session, others two hours. All agreed that they had not received sufficient training and would have liked more after they had used it. As one student commented:

> "It's training that's needed, just now and again having a refresher to see the potential".

It had been difficult learning how to use the tool, which is what PebblePad is - a tool that provides the facility for online storage and organisation of assets (pieces of work), together with the ability to share and collaborate with others. One student reported,

> "It has taken me ages and ages to work out how to work with it in the first place"

and another:

> "That you learn through trial and error".

However, for three students trial and error resulted in losing work because they did not realise they had to save before going to another screen or the work was lost. They also discovered that if they clicked the middle button of the mouse on the computers in the University library, the system crashed, and it appeared to be impossible to upload files greater than 5.4 mb, two issues that were expertly demonstrated by a student during an interview. This appeared to be a difficult learning curve for the students and one that understandably caused frustration with one student saying that she:

> "Hated the system".

This reaction is considered by Bergan (2007) as a reaction due to the value placed on the technology by the student. The perception of the students was that the support structure in place was to ask the tutor if they had problems, but as one student correctly commented,

> "This is new for the tutors as well as us"

and expressing optimism for the future:

> "It will be all right for next year."

Working with tutors with low levels of expertise of using PebblePad was a particular frustration for a number of students together with annoyance of having to wait for responses:

> "Every time I ask her a question about PebblePad she needs to go back and ask the course leader so it is constantly getting things back late, getting confirmation really late and in all honesty it seems that some members of the course team just don't know how it works."

I felt that if it had been possible to respond immediately to problems encountered the negativity of support may have been avoided, but this did not happen and for these students they did not see the level of support as adequate for their needs.

It was reported by one student that she had not been able to log on to PebblePad until February 2010. She found it hard to understand why only one person in the University

had an overview of all the PebblePad accounts and was able to help with her particular problem. She said that she has to email the person and:

> "He doesn't reply for over a week."

The length of time is not surprising to me given that one person is responsible for ensuring the administration of all the accounts.

The issue with upload was evident during the second round of interviews as this was the time when they were adding evidence in the form of images and larger files. At this point the students discovered that images needed to be compressed and often they did not have the skills to carry this out, and large documents needed to be zipped, again without the skill to be able to do this then it cannot be achieved.

As a result of the frustration of using PebblePad all students stated that they would not use PebblePad in the future even though it was available for them to use for one year after the end of the course.

'System'

For 'System' the percentages of total coding for the interviews are shown below.

- First interview – positive comments 0 per cent, negative comments 3.2 per cent
- Second interview – positive comments 0 per cent, negative comments 0 per cent
- Third interview – positive comments 0 per cent, negative comments 0 per cent

The issues that concerned the students with regards to the system focused on the initial problems of being able to access the system and how reliable they felt the system was. After using PebblePad for one term, these issues were not re-visited and may have been resolved through familiarity with the system or initial snags resolved through support. This led me to believe that the students were not concerned about the technology. It was aspects of course design that caused them anxiety.

'Scaffolding'

For 'Scaffolding' the percentages of total coding for the interviews are shown below.

- First interview – positive comments 3.2 per cent, negative comments 18.8 per cent
- Second interview – positive comments 4.9 per cent, negative comments 8.0 per cent
- Third interview – positive comments 3.1 per cent, negative comments 16.9 per cent

Feedback

In this category the students acknowledged that they were given feedback through the e-portfolio and this was seen by some as a positive aspect of the e-portfolio (first interview 14.2 per cent of which 11.9 per cent were negative, second interview 8.7 per cent all negative, third interview 12.3 percent of which 9.2 per cent were negative). At the time of the first interview the students were aware of those tutors who were inexperienced with using ICT and those who were proficient and had identified those tutors who were struggling with the use of PebblePad. The nature of the feedback had a direct connection to tutor expertise. For those students who reported that feedback was considered adequate or above, then this was a direct result of being in a tutor group where the tutor was perceived as having good knowledge of how PebblePad worked. For instance comments included:

> "Some members of the course team just don't know how it works",

and

> "Mind you a lot of the tutors do not have much of an idea of how it runs or seem overly confident in using it which doesn't help."

This was a cause of concern for the students who were relying on the tutors for advice on how to use PebblePad. They felt empathy with the tutors who were trying very hard to support them. One student commented:

> "It is frustrating for us that they don't know what they are doing, and it must be frustrating for them".

These comments continued to arise in the second round of interviews, but this time only two students referred to the lack of expertise when particular problems had occurred with comments such as:

> "It is very hard to work it out when none of you including the tutors know what to do"

and:

> "My tutor just says I will check with the course leader and come back all the time. It would be nice if they all knew what to do straight away".

The dissatisfaction with regards to differing levels of tutor expertise continued into the third interviews with a comment that:

> "Feedback has been completely dependent on whom your tutor is and this is unfair. In my opinion we all pay the same amount of tuition fees."

Further analysis of the comments in respect of feedback indicated that they were reliant on this in order to clarify their understanding of the expectations of the course. They concentrated on the time that feedback was given and the discrepancies in the way the tutors actually achieved this, together with the desire to receive feedback in order to clarify the expectations. From the transcripts of interviews the majority of comments regarding feedback centred on the responses from tutors, not in any way criticising the design of the e-portfolio. It was not evident until analysing tutors' interviews that they had encountered difficulties giving feedback, and analysis of their interviews gave an explanation for the discrepancies in time and level of detail of feedback. The students' perception of the feedback, although passing comment on inconsistencies between tutors,

indicated that the reason for tensions may have been based on the need for confirmation of doing the right thing. For instance two students commented when their group started to get feedback:

> "Some of our group are starting to get feedback, but I haven't had any and I don't know if what I am doing is right or wrong at the moment"

and:

> "Still waiting for feedback and it's sort of am I going about it the right way I realise it is an ongoing situation evidence being built up over a period of time, but you don't want to be going completely down the wrong path"

These students clearly needed the feedback from the more informed other, the tutor, to clarify their achievement. Without the feedback there appeared to be a feeling of uncertainty. These comments do not convey a feeling of animosity towards the tutor for the lack of feedback, but indicate that feedback is necessary for them to lessen the anxiety about the way in which they are working or the level of that work. There is a sense of needing the scaffolding of feedback in order for them to be able to move their learning forward. This provides an indication of the students' understanding of the underpinning theory of learning. There is an emerging theme of feedback being the essential element to the learning process for these students with regards to the course content. Another student who had received feedback, revealed empathy with those who had not received feedback, it was reported by three of the interviewees that there was a growing feeling of hostility regarding promptness and discrepancies in the time-frame for feedback. One student commented:

> "There are people who haven't had feedback yet, I am upset about that and it is difficult if you have had feedback and others haven't and that is causing problems. They are getting angry because we have feedback and they haven't".

Those who responded commented on the dissatisfaction of their peers, moving the negativity away from themselves to the feeling amongst the whole group. It was reported by all students that the majority were unhappy due to the fact that the usefulness of

feedback received depended on the tutor group. However, the context at the time shows that this may have been a time of anxiety for the students, they had used an e-portfolio which all interviewees had found difficult to use, it was towards the end of the first semester when they had been out on placement and away from the University, and as the interviews confirmed they had not engaged with PebblePad. Additionally the first assessment of their work was taking place.

One of the comments revealed how a student had bypassed the PebblePad system and emailed the work as a Microsoft Word document direct to the tutor rather than relying on the e-portfolio. This indicated that some may be proactive in this situation seeking out information, taking responsibility for the learning using a different communication route. Later interviews confirmed that this was a method of bypassing the system that a number of students and tutors used in order to communicate:

> "Although we handed in four I only get feedback on one of them and whether they randomly sampled I am not sure they don't have time to look at each one. So I emailed them to my tutor and said these are my best four can I have feedback so I know if they are right"

Only one student in the sample group was completely satisfied with the promptness of the tutor response and the content of the feedback:

> "I am incredibly fortunate to have a tutor who is really utilising it properly and real dialogue going on between tutor and student to try to help one another".

It is interesting that the response makes the assumption that the tutor is "really utilising it properly", making a judgement of what is right and what is wrong and it could be interpreted that the learning experience would be enhanced using PebblePad in this way. This response, along with the others does strongly suggest that scaffolding is necessary to move the learner forward.

By the second interview all but one student had received feedback from their tutor. The responses revealed that the students felt disappointed that they had not received feedback

on all of their work, and that tutors in some cases had not looked at the work the students had expected them to:

> "I did a lengthy journal entry and it didn't get looked at!"

This suggested to me that there may be a problem with the way in which the students are sharing the work, and, that the tutors may not be seeing the aspects of the e-portfolio that they are being asked to comment on. Therefore, whilst positive about receiving feedback, students felt negative as not all work was looked at.

'Experience'

For 'Experience of Using' the percentages of total coding for the interviews are shown below.

- First interview – positive comments 2.7 per cent, negative comments 18.8 per cent
- Second interview – positive comments 0 per cent, negative comments 29.8 per cent
- Third interview – positive comments 7.7 per cent, negative comments 15.4 per cent

Within this category the students expressed their thoughts on issues experienced using the system. By far the highest number of responses referred to the purpose, motivation, technical issues, no auto-save function causing loss of work, inability to navigate the tools, and system crashing particularly in the early stages of the research. Positive comments from students regarding reflection were made by the end of the year. This was discussed in the third interview when 7.7 per cent of comments suggested that the e-portfolio supported reflection. Within the category 'Experience' the issue raised most frequently (see Appendix 10) was purpose, as discussed below.

Purpose

During the first round of interviews the students commented on not understanding the purpose of using PebblePad, and reasons given included that it had been an executive decision by the University and so that you can access it at a distance. As one student stated:

> "I don't see that it offers any value to the course"

and another that:

> "It is a big hassle, you have to do it".

By the second interview some students commented on it not being fit for purpose as they had:

> "All as a group struggled using it and therefore the University should have admitted that it was not successful and stopped using it."

It is interesting that by the end of the course no comments regarding the purpose were discussed. This may indicate an acceptance of PebblePad as part of the course.

By the second interview all the students agreed that PebblePad was not an integral part of the course and that they did not use it whilst on placement. The main issues commented on with regards to its use include:

> "Not integral"
>
> "Didn't use in placement"
>
> "Will not use after training"

This infers that they viewed PebblePad as an activity carried out whilst in university and not in school and they kept this activity separate from their placement. The data suggested that the students compartmentalised the activities of the course as something they did on campus and something they did on placement. Interaction with PebblePad was regarded as a campus activity. Evidence they collected for the Standards and as part

of their reflective journal came from the placement as well as from their reading. It may well be that whilst on placement these students had planning, teaching, evaluating their lessons and that they did not have the opportunity or time to interact with PebblePad. As one student commented she did not see PebblePad:

> "As a priority".

One of the aims of introducing an e-portfolio on the course as defined by the University's Education Strategy (2008 – 13) Transforming Education is:

> 'The University has been piloting the use of e-portfolios to structure and support student learning. E-portfolios fit with the PDP model of learning, support the personalisation agenda and can also serve to structure learning for students studying remotely from the University. We will further develop the use of e-portfolios as a framework to enable all students to record and review their progress and e-PDP as a means for structured and supported development.'
>
> (Research University 2008)

The intention that this one store of information would be central to the life-long model of learning does not seem to be shared by the students who indicate their intention to discontinue using it at the end of the course.

4.2.2 Analysis of tutor data

Data was gathered through a questionnaire (Appendix 4), attendance at tutor meetings and interviews carried out one each semester.

4.2.2.1 Tutor questionnaires

Six tutors involved in delivering the course taking the role of Course Tutor were invited to complete the questionnaire. In June 2009, four responses were received.

Computer skills, anxiety when presented with new technologies and prior experience

Tutors responded by one reporting good skills, one suggesting that skills were adequate and the respondent was self-taught, one that the skills were developing and another that the skills were 'ok' but not sufficient to deal with PebblePad as they did not have prior experience of using this particular e-portfolio. All respondents suggested that they felt fairly confident but needed to be convinced of the relevance, advantage it presented, and needed assurance that support for the technology and skills in exploiting the potential were readily available.

Training needs

Tutors reported they had diverse training needs but all felt that they needed to use PebblePad before they would be able to identify exactly what training was required.

Purpose

Three tutors responded affirmatively without making further comment and one added the comment:

> 'To facilitate an online method of storing reflections and collect evidence and because the Uni want Pebblepad used.'

E-portfolio for learning and teaching

Three tutors commented on the advantage of having all the students work in one place. With regards to the social constructivist theory underpinning the use of the e-portfolio one commented that it would be used for:

> 'Formative feedback to direct and support'

another that it:

> 'Will promote student-student, personalisation and independence' and enable trainee teachers to see 'The 'holistic' nature of being a teacher by allowing them to reflect on practice, theory and the QTS Standards.'

All tutors responded by suggesting that using the e-portfolio as a tool would help in giving feedback and support, although they acknowledged that this would become clearer when they were using the tool. This mirrors the University understanding of using PebblePad, as they state on their website:

> 'The advantage compared with a simple web portfolio is that it is possible to receive constant feedback from peers or lecturers, all in a real time.'
>
> (Research University 2009[13])

4.2.2.2 Tutor interviews

Content analysis was carried out on the transcripts of the tutor interviews. These interviews took place with six tutors at three times during the course, one interview a semester (see interview schedule Appendix 6). As with student interviews these were classified under the headings of 'Academic Conditions', 'Technical Conditions', 'System', 'Scaffolding' and 'Experience' (see Table 11).

It was a deliberate decision to use the same categories as students as these were the areas to be explored in order to address the research questions, however, within these categories different subsets emerged.

[13] The identity of the participating University has been withheld to prevent identification of individual members

Table 11. Categories and issues within each category at three points in the course in three tutor interviews

	Issues		
Categories	**1st Interview**	**2nd Interview**	**3rd Interview**
'Academic Conditions'	Assessment	Student priority/lack of status	Assessment
	Students not see connections	Assessment	Pedagogy
	Low Priority - students		Attainment
	Workload		Workload
	Cultural shift-pedagogy		
'Scaffolding'	Feedback	No comments	Formative feedback
'Technical Conditions'	Time to learn	Tech support/issues	Connectivity
	Training	Training needs students/staff	Training
	Potential of system	Control over/design changes	Unreliable
	University led		Safeguarding
			Tech support
'System Conditions'	Not robust	Student difficulty in uploading	Bad design
	New Vocabulary	Alternative ways	Track changes
	Track changes	Security	Upload problems
		Interoperability with existing	Not robust/tech issues
		don't know PP	Ownership
		Not robust	
		Cannot see progression/development	
		Mechanics impacts on times	
		Track changes	
'Experience'	Face 2 face/Peer support	Relationships f2f	Relationships
	Technical issues	Not using in way intended	Two layer approach
	Barrier	Barrier to learning	Barrier to learning
	Time	Refined course	Loss of faith
	Reflection	Does not do what we want it to	Student engagement
	Not up to expectations	Scanning time consuming	Accessibility
	Relationships	Duplication	Reflection
	Student needs	Not adding value	Access school/it
	Not adding value	Repository no impact on reflection	Expectations
	Easy to use	Negativity to PebblePad by students	Time

Content analysis for tutor interviews in the pilot is shown in Appendix 11. The content analysis identified both positive and negative comments for each category. In the first interview 121 phrases were coded, in the second 129 phrases and in the third interview eighty-four phrases coded.

'Academic Conditions'

For 'Academic Conditions' the percentages of total coding for the interviews are shown below.

- First interview – positive comments 2.5 per cent, negative comments 9.1 per cent
- Second interview - positive comments 13.2 per cent, negative comments 10.8 per cent
- Third interview – positive comments 0 per cent, negative comments 20.2 per cent

This category accounted for twelve per cent of responses in the first interview, twenty-four per cent in the second and seven per cent in the third. During the first interview frequent responses concerned the students not seeing the connections and the cultural shift when changing to a different way of working. This referred to how the students did not understand the connections between what they were being asked to do on PebblePad to meet the aims and objectives of the course:

> "I think my concern is that a lot of them are not seeing it as a core part of their learning and as a result quite a lot of what they are doing is superficial".

Taking into consideration the comments from the students that they did not understand the expectations of the course then this is not an unreasonable conclusion. With regards to the cultural shift these comments revealed that the cultural shift of the University was to embrace e-learning and as we live in a digital age then:

> "A band wagon we need to jump on"

and the move to adopting PebblePad was a result of the University-led initiative. All those interviewed supported the move to e-learning and acknowledged the advantages of working in this way, although some did question having to amend their way of working to fit in with the system rather than the system being designed around existing working practices. There was a sense that both tutors and students needed to make a cultural shift to find better ways of using the platform so that it achieved the aims, with an acknowledgement that they were beginners and more experienced of working in other ways.

The comments on workload referred to the students' workload and the endeavour by tutors to reduce duplication. The tutors acknowledged that workload was an issue for students whilst on placement, and, that they were at a stage in the course where all the paperwork they produced for teaching was taking them a long time, as a result of this:

> "The PebblePad bit is fairly low down in their priorities and pragmatically when they are in schools the planning and review of the lessons takes up a lot of their time".

This became more of an issue by the second round of interviews when tutors reported that PebblePad was not a priority for students and lacked status. This may have been connected to the students' perspective on feedback, due to the technical problems they were experiencing or demands on time leading to prioritising workload. When individuals experience difficulties they can often lose faith in the system and then this becomes a barrier in the learning process. From the tutors view point by the second interview they were finding it very difficult to identify a given asset or part of the e-portfolio they were required to assess, therefore the assessment process was taking longer than anticipated. They commented on how they could not see who the asset belonged to or the sections they were working on at Masters Level. This, as discussed earlier, was due to the tutors' lack of skills in using the system and that the students did not have the

knowledge to enable them to display their name or how to rename and re-order the sections. If they had acquired this knowledge during the training period then the task for the tutors would have been less problematic. By the third interviews the tutors commented on the difficulties of assessment particularly the final assessment when, due to the way students were sharing their e-portfolios with tutors, it was not possible for all to see all the students' work, making moderation of marking difficult to achieve unless all the tutors were together. There was a solution to the issue but unfortunately the tutors did not know that this was possible.

'Technical Conditions'

For 'Technical Conditions' the percentages of total coding for the interviews are shown below.

- First interview- positive comments 9.1 per cent, negative comments 5.0 per cent
- Second interview - positive comments 6.2 per cent, negative comments 8.5 per cent
- Third interview - positive comments 0 per cent, negative comments 11.9 per cent

Training and support was a concern for all tutors who acknowledged the need for both tutor and students to have adequate skills to use the system effectively, and, in the first interview for them to appreciate the full potential of PebblePad.

The big concern from the tutor perspective was:

> "That the more students we have using it the more technical support is going to be required and we only have one person".

In other words, it is their inability to support the students who experienced problems and knowing that one person cannot possibly support the whole of the University. This was confirmed by comments such as:

> "There are bizarre things like they will be working on it and it will close down and then they will lose everything. It just happens and I email straight out to the person supporting and he can't answer stuff like that"

And:

> "Students are frustrated when the system crashes".

In addition to support for the students, they also felt that having one administrator for the University caused issues for them, such as not being given full administration rights for all the tools on the e-portfolio. This issue was addressed but not until tutors had invested a great deal of time trying to locate tools that they were assured were available.

'System Conditions'

For 'System Conditions' the percentages of total coding for the interviews are shown below.

- First interview - positive comments 0 per cent, negative comments 6.6 per cent
- Second interview – positive comments 0 per cent, negative comments 26.4 per cent
- Third interview – positive comments 2.4 per cent, negative comments 26.2 per cent

By the first interview tutors were becoming aware of some problems the students were encountering with how the system operated. The major problem reported was the loss of work when using PebblePad as the word processor, as one tutor member reported:

> "System sometimes fails us and the students say that they have typed pages of things and about to send it and it vanishes from the screen, so from a student perspective that is very frustrating."

This reflects the level of understanding on the part of the student of how the system works and the idiosyncrasies of the system. This issue was not included in the third interview, a time when the students would have had the experience of using the system

and learned how to avoid these problems. However, the problem with uploading files was becoming more evident with more use, this was an issue also reported during student interviews. Uploading involved problems with the size of the files and as multiple files had to be uploaded then the problem increased as the course progressed. Both tutors and students reported that this process had an impact on the time it took to achieve anything on PebblePad. Problems with uploading included reports of files being too big, the system taking too long to upload and then being timed out which appeared to be a broadband width issue whilst on campus, and some found that when uploading in a particular way the system would fragment the files and show them as different files on the system.

By the second interview tutors had growing concerns over the way in which the system enabled them to give feedback. Traditionally they had used the track change facility in Microsoft Word and this had proved to be a successful way of providing comments throughout a piece of work. PebblePad does not, as yet, support this way of working. The tutors found they were only able to give comments at the end, changing the nature of the assessment from formative to summative. Some tutors reported that to solve this problem they asked students to produce work in Microsoft Word, email to them, they would carry out track changes and then when edited this could be copied and pasted into PebblePad, resulting in PebblePad showcasing the work as a product rather than showing the progression and producing a layer of activity for the students.

By the third round of interviews the tutors had collectively agreed that the system was not fit for purpose and an alternative approach to e-learning would be used for the next academic year.

'Scaffolding'

For 'Scaffolding' the percentages of total coding for the interviews are shown below.

- First interview – positive comments 5.0 per cent, negative comments 13.2 per cent
- Second interview - no comments
- Third interview – positive comments 14.3 per cent, negative comments 0 per cent

The above figures would suggest that during the second term feedback was not an issue because it is not commented in this section. During this round of interviews the tutors did not comment directly on feedback but did report on different aspects in other areas, such as, track changes and assessment implying the importance of these issues.

During the first interview the tutors were very positive about the system as it would be a vehicle for giving more formative feedback:

> "They are given formative support to get to their end result which we were never really able to do before"

and

> "At four times you can give them that formative feedback to help them adjust what they are doing and they are responding to that."

Giving the students feedback at set points in the year does seem to be at variance with the University perception of a platform where it was possible to 'Receive constant feedback from peers or lecturers' (University name withheld 2010). Perhaps this is reflecting on the capability of the platform, rather than the capacity of the tutors. However, by the first interviews some tutors began to question the effect this method of working would have on the relationships with students. Some were choosing to give feedback during face to face sessions or by email rather than on PebblePad, and it is not apparent if this is directly related to their dissatisfaction with the feedback process, their skills or preferred way of working. One tutor acknowledged there was a need for consistency across the tutor groups to ensure they were working in the same way. Given that tutors were reported to

have different ways of working it does clarify to a certain degree the student dissatisfaction on how feedback was received.

After reflecting on the data I felt that students, who reported no feedback through PebblePad, may have been getting this in a less formal way in a different route and not acknowledging it as feedback. A different conclusion may be that feedback delivered in what students may perceive as an informal setting – when part of a tutor group or during a casual meeting – may not be interpreted as formative feedback. This is an issue to be considered in overall course design.

'Experience'

For 'Experience' the percentages of total coding for the interviews are shown below.

- First interview – positive comments 13.2 per cent, negative comments 36.4 per cent
- Second interview – positive comments 2.3 per cent, negative comments 32.6 per cent
- Third interview - positive comments 0 per cent, negative comments 25.0 per cent

For the first two rounds of interviews this section produced the greatest number of coding, by the third round it was second to the coding on the 'System'. By this stage the focus was on why the system did not support the course, understandable when given the climate of dissatisfaction. The highest categories do give an indication of the important issues at that particular time. In term one the students and tutors were experiencing a high number of technical issues when trying to use PebblePad for particular purposes. When accessing the shared assets tutors found they could not achieve what they wanted, for instance one comment stated:

> "I would like to identify strengths and weakness but no track changes and those irritating things like when you get the work on screen you cannot see the name anymore get in the way"

and:

> "I don't understand why we have silly pictures and sounds"

These issues impacted in a negative way on how tutors perceived PebblePad as a useful tool. However, the majority of tutors acknowledged that the system was easy to use; it was their experience of the perceived peculiarities that appeared to cause concern and increased on the time it took to carry out the work. As previously discussed, one particular difficulty was seeing that an asset had been shared but having to spend time finding it and identifying the part the student wanted a tutor to look at. By the second interview the focus was on relationships and the acknowledgement that using the system was having a detrimental effect on the way some tutors were able to form relationships with their group of students.

The system was not perceived to be one-hundred per cent robust and some students were advised to work in Microsoft Word, (leading to duplication of work), then transfer to PebblePad to ensure security of the work:

> "It has to be 110 per cent robust not 99 per cent and there has to be ways of doing that from the software point of view, so I have students who are not doing it they are doing stuff on Word files, so not on PebblePad and eventually they will upload to PebblePad which completely destroys the whole point of it. It is the only way of them having security that their stuff is safe, so okay what they should be doing is uploading bit by bit but it is a hassle."

4.3 Discussion of findings

The analysis of the pilot data enabled some insight as to why the implementation of an e-portfolio was not entirely successful. It was concluded that the perceived experience of the first year of using an e-portfolio for both the tutors and students on this particular course was not satisfactory. However, there is a differing opinion on why this is the case.

From the content analysis of the data it would appear to imply students' dissatisfaction with the way in which the e-portfolio was used over the duration of the course and lack of tutor skill at the centre of the issues, whereas tutors felt it was PebblePad as a tool that was the central issues for dissatisfaction. These factors are discussed in detail below.

4.3.1 Student questionnaires

The student questionnaires gave an insight into the background of those involved in the course. Although the students reported a high level of confidence in using a computer on the initial questionnaire (91.1 per cent point four or above on the confidence scale), this was confirmed by 86.7 per cent confirming they used a computer for email everyday and for social networking, 70.0 per cent at least weekly. This appears to confirm that the use of technology has been normalised by this generation of students (Green & Hannon 2007), with a small percentage (less than thirteen per cent) not using email daily and one fifth of the cohort not using social networking. As pointed out by Young (2008), success in using the e-portfolio as a pedagogical tool was more likely if users had the technology skills. The same students' score on anxiety when faced with new programs was 67.8 per cent (point four or above on anxiety scale). This would infer that the group was confident using their computers for routine tasks, but when faced with the prospect of learning something new then the anxiety levels for over a third of the group were relatively high. The reasons for this anxiety were perceived as a result of the anticipated level of training given, this goes further than the need for training as outlined by Green and Hannon (2007) and McNair and Galanouli (2002), but the inference that students did not perceive they would receive adequate training. As 92.2 per cent had not used e-portfolios before and prior use is seen as a factor in successful implementation of an e-portfolio (Studler & Wetzerl 2006; Gathercoat *et al* 2002), and seventy-eight per cent had no experience of keeping reflective journals this would indicate that the training needed for this group in

both using the technology as a tool and understanding how it could support their reflective writing was required. The fact that over sixty-one per cent preferred keeping paper copies of documents added another factor to the possible failure of the implementation. Preference for paper copies may have been due to inadequate training, fear of loss of data or as a result of prior experience. Keeping paper copies resulted in duplication of records. If students keep duplicate records they may not value the e-portfolio and waste a considerable amount of time maintaining both (Lorenzo & Ittelson 2005).

From the results of the second questionnaire it was possible to have an insight into the perceptions of the students following five months experience of being on the course. This revealed that the students all felt they had the skills to use the e-portfolio but that over half (53.8 per cent) did not feel they had access to appropriate technical support and 61.3 per cent would have liked additional training. This concurs with the outcome of the research carried out by Grier *et al* (2006) who concluded that students needed ongoing access to training when using this technology.

The second questionnaire gave the respondents the opportunity to comment on the purpose, from the comments in section 4.2.1.2 it would appear students did not understand the purpose, although they all said they did. Only two commented that the e-portfolio was not the most effective way of demonstrating they were reflective practitioners. Understanding the purpose is seen as one of the biggest hurdles during the implementation stage (Cotterill *et al* 2004b; Roberts *et al* 2005; Tosh *et al* 2005). It is the purpose that determines use, and if this is not understood then students will not know how to use the technology (Barrett 2006; Cohen 2005). As the respondents reported that they only used the e-portfolio whilst on campus (92.3 per cent) this indicates that they were not following the guidance given in the module handbook which stated they should

interact with the e-portfolio weekly. All the respondents from the second questionnaire received their feedback through the e-portfolio and the majority had received feedback on two occasions (84.6 per cent). This would indicate that tutors had a shared learner-centred pedagogical approach, giving feedback on the construction, by the student, of the e-portfolio (Kimball 2005).

4.3.2 Student interviews

The interviews gave an insight into the student perception suggesting the use of the e-portfolio was not a successful part of the course. The content analysis revealed that in the first interview 88.5 per cent of comments were negative, second interview 95.1 per cent negative and the third interview 89.2 per cent negative. However, in all three interviews the feedback did receive some positive comments (2.3, 4.8 and 3.1 per cent) suggesting that some did see the e-portfolio as a way of supporting scaffolding from a more informed other. The students did not see the tool as the reason for their dissatisfaction. They felt that the lack of tutor skills resulted in tutors not being able to support the learning (Green & Hannon 2007) and this was the central factor for dissatisfaction (see Figure 2). The lack of tutors' expertise, for some students, resulted in unresolved issues regarding the use of PebblePad and the best use of its tools.

Gaitan (2012) uses a similar diagram explaining the perspectives of students' experience using an e-portfolio in his research where 'attitude' is seen as the central issue. In this current research the data would imply that the students' dissatisfaction is a result of the concrete experience with the over-riding issue of lack of tutor skill.

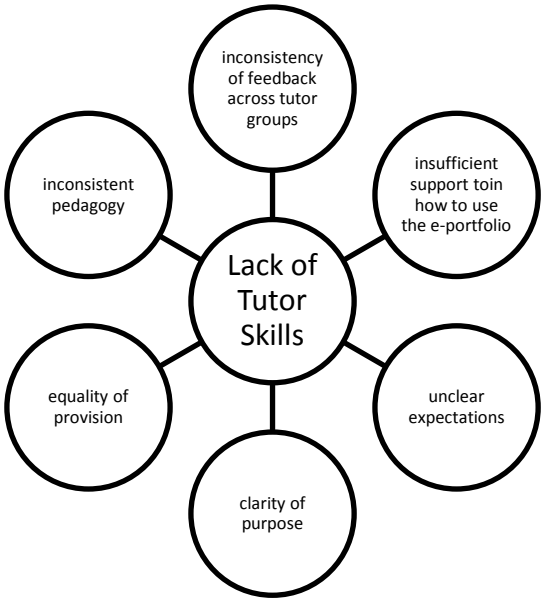


Figure 2. Student dissatisfaction - issues connected to lack of tutor skills

The perceived lack of tutor skills resulted in not understanding the course expectations (Cotterill *et al* 2004b; Roberts *et al* 2005; Tosh *et al* 2005). The importance of training is highlighted in the literature review, with writers such as Green and Hannon (2007), McNair and Galanouli (2002), Grier *et al* (2006), Bartlett and Sherry (2006), Woodward and Honoly (2004), who outline the need for adequate training of all participants.

Course Expectations

The amount of work to be completed was seen as a major factor for dissatisfaction by the students. When tutors realised that the students had too much to do they responded by reducing the amount of work at Masters Level. The students' interpretation of this was negative. This may have perpetuated the feeling of confusion over what was expected, with the students not having confidence in the permanency of course guidance. When presented with a course as a paper file it is possible to flick through the pages, skim the contents, and see the totality of the task. With online content it is not possible to do this. This would explain the comments of not knowing what to do because they were not able

to see the task as one entity. The students' uncovered different elements as the course progressed, and because of this did not have a clear picture of the module in totality. Therefore, when talking to one another they often discovered other elements that they had to achieve, things they had not discovered by themselves. This caused distress for those who thought they were on track but found out inadvertently that this was not the case. As a result students wanted to be told what to do, as expressed by one student:

> "Just tell us what we have to do".

Feedback

Students needed their learning scaffolded by those they perceived as the more informed other, the tutor. From the comments regarding the content of feedback it was evident that the students relied on this to understand the expectations of the course. It was the response to their work that confirmed they were:

> "doing the right thing."

Therefore, if the tutors had the expertise to know how the students could best engage with the tools on PebblePad, and gave feedback at the times dedicated for this then the experience of the students using the e-portfolio may have been more positive. In summary, it appears from the analysis of data students found the guidance and interaction from the tutor a significant factor in the successful completion of the e-portfolio. If they perceived this as lacking in some way then they also perceived this to be detrimental to their training experience. The purpose of the feedback on this course is to develop the learning by providing advice and signposting in order for students to become reflective learners. Individual tutors are providing the scaffolding which allows the student to construct their learning. It is seen by both parties as pivotal to the successful completion of the course, but given the reported problems with discrepancies in how and when feedback was given, this does not appear to have been the experience of the students,

particularly as tutors adopted different pedagogical approaches. It would appear from analysis of the comments that the students did not see the relevance of using the e-portfolio on the course as it proved to be a barrier to achieving the work and that feedback was also an unresolved issue. These two issues are those highlighted as ultimately affecting engagement of users (Murray & Smith 2006).

Lack of integration of PebblePad

Students did not see PebblePad as an integral part of their course, only interacting with it after the placement had ended and on campus. This appeared to confirm that the e-portfolio was not seen as a holistic approach or possibly relevant to their training, or as pointed out by Henry (2001) a product that was not convincing to the audience. This was not the intention and, as stated previously, not the intention relayed via the module handbook. From the students' perspective they did not see the role of PebblePad connected to the activities of teaching. This might be due to the overwhelming nature of the work in which they are engaged, planning, teaching and evaluating as well as fitting into the life of the school. It may be argued that this may well have been the case if students were using a paper-based portfolio for reflections; the problem is not related to e-learning, it may well have been a historical issue on this type of course. With paper versions the tutor cannot determine frequency of engagement as they can only view it when handed in. With the advent of e-learning and twenty-four hour, seven day access this is no longer the case. With PebblePad this will only be achieved if the student decides to share with tutors, however, it is the role of 'teacher' they considered superior to the role of 'university student'. When in school they were the 'student teacher' being guided to take responsibility for a class as a practical part of their training. When on campus they were the student exposed to the theory of teaching and engaged with the administrative activity of completing reflections on PebblePad, which to some degree was

a duplication of paper-based activities. Therefore, they perceived placement in school as the most important part of their training. This would appear to be a reasonable assertion given this is the profession for which they were training. The workload in school appeared to be one issue and their perceived interpretation of the level of engagement by the tutors exacerbated the situation for students. If tutors do not know how to use the system effectively and cannot support them, then it is reasonable to conclude that it will not be a priority for them, especially given the fact that some tutors responded by using alternative routes. This might have given a message to the students that it is not necessary to use PebblePad; there is an alternative route to PebblePad. It is concluded that due to the experience of using PebblePad on this course, the result has been an inconsistent learning experience for the students.

Continued use

As a result of the experience all students reported they would not use PebblePad after the course ended, even though they had free access for one year. All work uploaded to the e-portfolio had been copied following course tutors' advice, and therefore no need for the students to go onto the e-portfolio to retrieve work. It was not possible to see how the students used PebblePad over the duration of the course, or indeed to check whether or not they interacted with the e-portfolio after the end of the course. This information was not available as this was not part of the philosophy of PebblePad.

4.3.3 Tutor questionnaires

The tutor questionnaires revealed that when learning new programs they gained their skills whilst using the tool. Their training needs were seen as something to address as they used the system. In addition, during interview it was suggested that training support could be sought from two members of staff within the faculty, but not on the course, who

were able to provide expert help. The adoption of PebblePad as the e-portfolio was because this was the system available at the University. Although it was reported by tutors that they felt pressured to use the University e-portfolio which may have had an effect on the way the technology was adopted (Higgison *et al* 2006; Murray & Smith 2006), this was perceived as the only system available. The purpose was seen by tutors as providing an online storage system, encouraging the use of technology and to encourage the development of reflective practitioners.

4.3.4 Tutor interviews

The tutors found the actual tool a significant factor in the failure of the e-portfolio meeting the e-learning objectives (Figure 3).

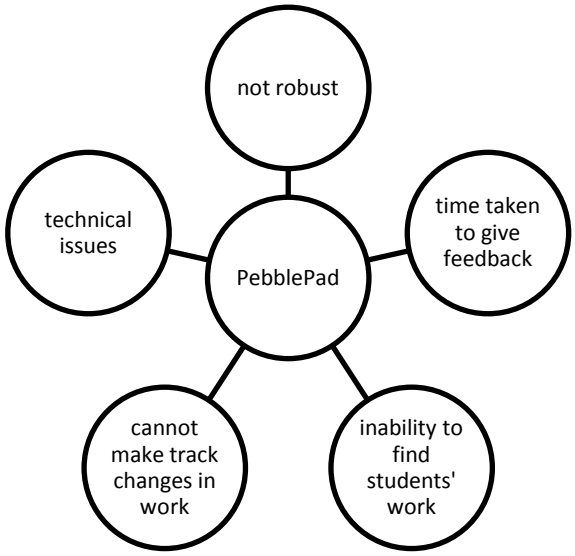


Figure 3. Tutor dissatisfaction - issues connected to PebblePad as the tool

They felt it was not fit for purpose as it was not robust, did not allow them to give feedback as they wished, and caused the students problems with the system crashing resulting in loss of work. This implied a lack of training which is fundamental in e-portfolio success (Green & Hannon 2007; McNair & Galanouli 2002). This situation may

reflect the view of Laurillard and Masterman (2009) who suggest that the adoption of technology in an institution can be technology-driven to the detriment of being education-driven. The potential of using PebblePad was acknowledged but the technical issues that resulted from not understanding how to use the e-portfolio caused issues with supporting students. These technical issues were not addressed promptly, and, if tutors do not perceive they have sufficient support this may influence their attitudes with regard the technology (Bartlett & Sherry 2006; Woodward & Hanoly 2004.) The tutors also discovered that they had not been given administration rights to access a number of tools on PebblePad. This resulted in them spending time trying to locate tools they knew were available for producing templates, but being unable to find them. They were eventually given these rights but this did not give them confidence of working with a tool that they were struggling to use, and highlighted the issue of having only one person administrating the e-portfolio.

Feedback

The amount of time taken to give feedback was seen as unacceptable, giving feedback through the e-portfolio is a time-consuming activity as acknowledged by JISC (2008). This was compounded by tutors not having dedicated timetabled slots from their teaching commitments for providing this feedback. The philosophy behind PebblePad is that it is a personal space to be used however the user chooses. In practice this means that tutors can only see the students' e-portfolio when they choose to share. This has an implication on time for tutors. If they allocate a time slot for feedback and the student has not shared the work, then this cannot be achieved. Ownership by the student does not facilitate twenty-four hour, seven day a week access by tutors. If, as in this course, the e-portfolio is a tool designed to facilitate the assessment of a module then the issue of ownership may handicap the feedback process. The e-portfolio was funded by the University and

used on a course run by that University. However, the user had ownership over the e-portfolio; it had not been used for any other purpose by the students other than for the requirements of the course and it was not the intention of the students on this course that they will use it after graduation.

Tutors found the way in which they had to give feedback to be unsatisfactory. This negative aspect of providing feedback was also an issue with the previous e-portfolio used as part of the VLE, and was highlighted by the Final Report on the 2007 pilot phase of using e-portfolios at the University which states:

> 'The only way to provide feedback is through the 'comments' section (button) which is general to the portfolio instead of specific to a particular section or page.'
>
> (Gaitan, Manton, and Jankowska 2007:27)

.

As pointed out by Young and Lipczynski (2007) one design may not meet the needs of all and the design of the e-portfolio is crucial in the successful use by both tutor and student.

4.4 Summary and personal reflection

As previously commented, one of the main strengths of using e-portfolios is that they can support the learning process by providing an accessible and easily portable repository for the storage of files, replacing the traditional bulky paper-based portfolios (Gaitan *et al* 2007, Sutherland, Beetham 2005, Stefani *et al* 2007). In addition they can provide support for trainee teachers to develop as reflective learners (Young 2008). This was what the course tutors expected when using the e-portfolio as PebblePad was adopted on the PGCE course for the purpose of assessment and accreditation. However, a number of issues were identified in the pilot through the analysis of what students and tutors reported. These issues related to students' confusion about what it was they needed to do in order to fulfil the requirements of the e-portfolio and 'overwhelming' expectations on both

students and tutors in respect of workload. Other issues that were identified through analysis concerned support, design, issues with system, training, ownership, equality of provision with regards feedback, together with the effectiveness of the e-portfolio as a pedagogical tool. In addition, tutors felt the problems encountered were due to the inflexibility of the e-portfolio tool which prevented them from achieving their aims, and as a result of this perceived problem, the decision was made to discontinue use of this particular e-portfolio at the end of the year. Some of these issues related to the way in which the course was designed.

An interview with the co-author of PebblePad confirmed that when designing the system they were aiming a system for multiple purposes allowing a scaffolding approach, social constructivism, and this underpins the use of the e-portfolio at different levels whether the scaffold is from internal dialogue when using a form or from peers when sharing or from tutors. This may be the challenge that universities need to resolve when taking a commercial resource and adapting for a specific purpose as on this course. As discussed by the co-author, those decisions regarding how PebblePad is to be used to support the course need to be explored during the planning stage; it is not a case of just transferring what you did on paper, and that the usual approach is to adopt the tool for a particular aspect of the course then build on that in subsequent years.

During the collection of the data I felt perplexed by the participants' responses, and it was not until I had analysed all the data that I began to identify what may have been the key issues (Schwandt 1997). However, I was disturbed by the level of negativity as I had not anticipated this outcome. On reflection feeling perplexed about this negativity was due, in part, to my work in ITT and the way in which, on my own course, I tried to ensure all tutors had the necessary skills to use digital technology, supported by administration staff before the introduction of an e-portfolio. I had found that this was a fairly

straightforward task to achieve given the small scale in which I was operating. I could see that implementation in a large institution was more difficult due to the amount of people involved. The findings from the data influenced my way of working on my own course in order to avoid replicating this negativity with my students. As commented by Bolton 2010 and Cunliffe 2002, it is standing back and viewing from an outside perspective that we begin to understand, and I feel this is what happened in my experience. From viewing as an outsider, and standing back from the situation I was able to identify what was happening and consider this within my personal experience.

Over the course of the pilot my perception of the implementation process changed. Initially I felt that the implementation of the e-portfolio would be relatively straightforward given the support from senior members of the University staff and the enthusiasm of tutors at course level. What I had not anticipated was the misunderstanding of the purpose for the e-portfolio by students, as I had expected that tutors would have ensured that the students knew why this technology was being used and discussed in detail the underpinning theory. The design of the course on the e-portfolio also left me feeling perplexed as it appeared to be extremely complex, was not clearly understood by students, and the workload it contained was overwhelming for the students. I felt at the time that lack of training was a major issue to be addressed. As I have had time to reflect my focus on the implementation process has changed from considering the pragmatic issues to thinking deeply about how courses are conceptualised, and understanding the importance of ensuring, in the design stage, that consideration is given to the model of learning. For instance, this is to ensure that the social constructivist model of learning which the students as trainee teachers are expected to use in the classroom is also applied to them as learners. This realisation led to a deeper understanding of the possible reasons for the failure of implementation beyond the pragmatics.

4.5 Implications for main study

From the experience of carrying out the pilot phase of this research I felt it was necessary to make some changes to the research design as follows:

1. The participation by an increased number of students by volunteer sampling to include a more representative group. The concept of the pilot phase was to concentrate on a small sample group in order to allow for a deeper analysis than would be possible with a large number due to factors such as time, resources and establishing effective relationships in the early stages of the process.

2. The pilot was designed as a feasibility study as well as providing comparability data from year 1. The decision to discontinue the use of PebblePad adopted in the pilot, and transfer to a tutor-designed e-portfolio for the second year resulted in the loss of opportunity for comparability of data using the same e-portfolio. However, the decision resulted in the opportunity to compare students on the same course over a two-year period using different e-portfolios.

3. Interviews with students were not arranged on the last day they are on campus as this greatly reduces any flexibility in re-arranging appointments. The final interview was arranged in May before the final placement.

4. A qualitative content analysis software program was adopted. This allowed for a greater speed in organising the data as well as providing a digital record of the content analysis. The topics that emerged were coded and organised under category headings and then additionally coded for negative and positive responses.

5. An additional question was added to the initial questionnaire to investigate the understanding of purpose for the use of the e-portfolio.

6. Data relating to the interactions that the students and tutors make was analysed to investigate frequency of use, context and reaction to feedback by the student.

7. Content analysis on the work uploaded for the Master Level element of the course was carried out to discover the place of reflective thinking. In addition, a framework for identifying the depth of reflection was used on this work.

8. All interview rooms were booked in advance so that all the participants had prior knowledge of the place of the interviews, and where possible consistency of rooms used maintained.

Chapter five: Main study- Part 1: Implementation of an e-portfolio and its use by trainee teachers

5.1 Introduction

The main study followed the tutors for a second year on the same course with a different cohort of students. PebblePad was replaced by an e-portfolio designed by the tutors using wikis on the VLE for the main study. The reasons for this was that all the tutors were experienced users of the VLE and had the necessary skills to support the students, the tutors were confident that the design was a significant improvement on PebblePad and they felt the e-portfolio using wikis was an adequate tool for the purposes of the course. Therefore, for the second year all students were expected to use this to complete the Reflective Practitioner Module. As in the pilot, this module had two distinct areas 'Tasks' and 'Themes and Issues'. The tutors decided to introduce a paper-based file of evidence against the QTS standards rather than have this evidence on the e-portfolio as in the pilot. I felt that the decision to reintroduce a paper-file for the evidence might have caused the students problems with regards to duplication of records. However, through the research I began to understand this move enabled slower implementation. Deeper analysis of the data suggested that the decision to keep records using different modes might have been a factor in the way students did not make a connection between their theoretical understandings and how this linked to practice.

Data collection for the main study was as follows:-

- student initial and second questionnaire
- student and tutor interviews

- student and tutor interactions to understand the frequency and place of interaction better
- analysis of the reflective writing on the student e-portfolios (see Chapter 6)

5.2 Initial student questionnaire

One hundred questionnaires were distributed with a return rate of seventy-four per cent being achieved (Appendix 2). Data analysed from the main study student questionnaires (Appendix14) showed that the profile of students in the main study was dissimilar to the pilot with regards to more individuals having prior experience of using an e-portfolio, more willing to attend interview and complete a second questionnaire. The first two questions required the students to rate themselves against a semantic differential scale with a range of one to six, one with the adjective low and six with the adjective high. All other questions required the ticking of boxes to indicate yes/no answers, or to select from a multiple choice list with space for comments.

Confidence and anxiety in computer use

86.5 per cent of the students responded five or six on the scale of self-confidence, indicating that the majority were confident users of computers (see Appendix 12, Table 1). The average of responses with regards to confidence was 5.21. This showed that the participants in the main study reported higher confidence levels than the pilot cohort. This indicated that implementation of the e-portfolio in the main study might well be successful (Gathercoal *et al* 2002; Strudel & Wetzel 2005.) Low self-assessment or confidence may have a negative influence on the successful implementation of an e-portfolio. In terms of anxiety when faced with new programs, students had an average score of 3.24. However, nineteen students selected two on the scale and twenty-one

selected four on the scale, with no students selecting the highest level of anxiety and eight per cent selecting the lowest level of anxiety.

Prior experience of using e-portfolios and preference of record keeping

Previous experience of using e-portfolios has been shown to be an important factor in the successful implementation of e-portfolios (Studler & Wetzel 2005; Gathercoal *et al* 2002). However, as seventy-five per cent of students had no previous experience of e-portfolios (see Appendix 12, Table 2) and more than seventy-five per cent had not kept a reflective journal before the commencement of the course (see Appendix 12, Table 3), it would suggest that these are factors that might well hinder the successful implementation together with the fact that the majority of students preferred to keep paper copies (see Appendix 12, Table 4). Scrutiny of the questionnaire returns showed that eleven students who had used an e-portfolio previously had not kept a reflective journal/diary.

The main reason given for keeping paper copies was the fear of losing data kept on a computer. Those students who wanted to keep data in both forms expressed safety as the reason. It appeared that students felt paper was the safer option, and that they needed a back-up, adding comments such as:

> "If they are really important always prefer to keep paper back-ups"
>
> "Both ideally, paper has more permanence but electronic is more easily edited"
>
> "I like to have a paper copy but with an electronic back up in case"
>
> "If something is really important, I think paper is more secure and safe"
>
> "I feel more secure to have a paper copy, especially as I've had a laptop crash completely losing everything before"

Frequency of using email or social networking

94.6 per cent of the students used email every day, with 63.5 per cent using a social networking site every day (see Appendix 12, Table 5). This would indicate that for the

majority of the students the use of communication via technology was embedded in their lives. This was particularly true with the use of email. However, 13.5 per cent did not use social networking, with a further 9.5 per cent hardly ever using this way to communicate. Therefore, while the use of email appeared to be routine within their lives, social networking was the choice of everyday life for 63.5 per cent. This appeared to reflect the literature that says that digital technologies are a normal and accepted part of life and fully integrated in most daily lives (Green & Hannon 2007).

Willingness to participate further

Of the students responding, twenty-eight (37.8 per cent) agreed to attend interviews (see Appendix 12, Table 6). Opportunity sampling was stated in the methodology for the sampling strategy adopted in this case study. This appeared to be a large percentage from the whole cohort, but the knowledge from the pilot would suggest that a third would not attend interview. If the main study followed a similar pattern to the pilot, then it would be anticipated that approximately nineteen students would attend interviews. The actual number attending interviews was seventeen.

With eighty-four per cent agreeing to complete a second questionnaire, experience from the pilot would indicate that approximately thirty-four per cent may, in fact, do so (see Appendix 12, Table 7). Sixty-two students agreed to complete a second questionnaire, fifty-nine gave adequate contact details and fourteen returned their second questionnaires. This was a disappointing return but it was not possible to circulate these and ensure their return in any other way for reasons discussed in the pilot.

Understanding of purpose of e-portfolios

A total of 82.4 per cent thought they understood the purpose for keeping an e-portfolio (see Appendix 12, Table 8). The course documentation contained clear guidelines for the function of the e-portfolio:

> 'It provides a medium through which you can summarise your observations, questions, learning and reflections as the course progresses. It is a record of your interaction with the learning opportunities which the course offers to further your professional development.
>
> It provides a collection point for Professional 'Tasks'
>
> It provides opportunities for you to demonstrate your engagement with key issues at Masters Level.
>
> You should make links to reading, university sessions, practice in school and the QTS standards.'
>
> (Professional Development Profile – Reflective Practitioner Handbook 2010-11;11)

The reasons given by the students indicated that there was no consensus of understanding about the purpose of using e-portfolios on the course; they centred on other issues instead, as the following comments suggest. (These comments were made by students who reported that they did understand the purpose):

> "Can see the benefits (access anywhere)"
>
> "For our reflective journal - updates about course lecture notes, emailing"
>
> "I could guess but haven't been told explicitly why"
>
> "I find the structure of the e-portfolio chaotic and unorganised system. Modules overlap so never sure where to look for things first. A quick task can take ages."
>
> "To develop our computer skills and creating our own personal profile of our experience"
>
> "You have to practice being a reflective practitioner, good for organisation too"
>
> "To ease access by tutors"
>
> "I know it's to check we're done the 'Tasks' and reflect/write about them. But I do wonder why we don't put QTS folder things up there or put the 'Tasks' in the QTS file, I wonder whether the 'Tasks' help us achieve QTS (necessarily)"

"Track progress - get rid of paper"

5.3 Second student questionnaire

The questions for the second questionnaire (see Appendix 13) emerged following the first interviews with students and tutors. It appeared from interviews that the students did not fully understand the purpose for the introduction of the e-portfolio or necessarily recognise the tutor as the more informed other in the social constructivist theory that underpins this use of e-portfolios. Therefore this was included as a question. Data from the second student questionnaire can be seen in Appendix 15.

Underpinning theory of social constructivism

From the responses, fifty per cent agreed the e-portfolio was underpinned by the theory of social constructivism, however, no comments were added to explain the response to the question. This would indicate that half of the students did not believe that this was the underpinning theory. This might be explained by the variation in the amount of feedback the students received and the way in which the feedback was received, not necessarily through the e-portfolio. Two students had received feedback twice, two three times and ten students had received feedback six times by this time in the course. The comments acknowledged that lack of feedback may have been due to the student's lack of engagement with the e-portfolio such as:

"It may have been more if I'd put more up for my tutor to view".

Others suggested they would make amendments to their work:

"Made amendments to my work and uploaded the new draft copy"

"Have yet to make changes suggested from feedback on themes but plan to do this in the next three weeks".

Other comments acknowledged that the feedback gave them confidence:

"An acknowledgement I was on the right track".

Two students commented that feedback was through email because this was the tutor's preferred route. Two students said they did not respond to the feedback because:

> "Haven't resubmitted the same work again as I didn't fail the original content"
>
> "It gives me the opportunities to edit and adjust work before final hand in, not now".

Four students stated they received feedback via email, five via email and the e-portfolio, two via the e-portfolio, one via email, e-portfolio or face to face, and two students did not respond. Those who indicated email as the medium for feedback suggested through comments, that this was a quicker way to receive feedback. If students emailed a tutor they would respond straightaway whereas they did not on the e-portfolio and for one student the tutor preferred to work through email. Those who had received feedback on the e-portfolio stated that these were short comments or annotations.

Skills and technical support

By this stage in the course all students felt they had adequate skills but one felt they would have liked more training. One student suggested that if the e-portfolio was designed well then no training would be needed implying that the design was faulty, another student commented he/she would have liked to have been able to organise the e-portfolio in a way that was easy for him/her to understand. The student who did require more training stated that the navigation to different parts was:

> "Long-winded with folders within folders".

Responses revealed three avenues for seeking help as peers, tutors, and librarians or technical support. The majority, seven (50 per cent) asked their peers, whilst three (21.4 per cent) asked tutors or peers, two asked tutors only and one student asked librarians.

Interaction with the e-portfolio

Nine stated they interacted with the e-portfolio whilst on campus and on placement, whilst two stated they only used the e-portfolio on campus, three did not indicate. The comments suggested that they used the e-portfolio to access documents for use in placement so checked the work on the e-portfolio at the same time. The length of time spent varied from one hour to ten (Table 12). The average amount of time spent per week was 3.2.

Table 12. Time spent on e-portfolio and context for interactions

Time spent in hours	Context						Total	
	Campus		Campus and Placement		Did not indicate			
	Freq	% of students	Freq	% of students	Freq	% of students	Freq	% of students
1 max	0	0	1	7.1	0	0	1	7.1
1 - 2	0	0	1	7.1	2	14.2	3	21.3
1 - 10	0	0	0	0	1	7.1	1	7.1
2	1	7.1	4	28.6	0	0	5	35.7
3	0	0	1	7.1	0	0	1	7.1
4	0	0	1	7.1	0	0	1	7.1
5 – 6	1	7.1	0	0	0	0	1	7.1
5	0		1	7.1	0	0	1	7.1
Total	2	14.2	9	64.1	3	21.3	14	100.2

Purpose

All responded that they did know why the e-portfolio was being used but the comments would suggest different understandings of the purpose, such as:

> "Yes, but in my last university it was more organised"
>
> "For the tutors to check your work"
>
> "I believe although it could be more user friendly most convenient way to tutor access"
>
> "I agree a portal is needed but this is badly designed and not effective"
>
> "Yes but not effective or fulfilling purpose"
>
> "Yes, but tutors prefer to use email"

None of the comments referred to any significant function in terms of learning, personal or career development suggesting that these students did not understand the purpose beyond a repository for work to be assessed.

5.4 Student interviews

Student interviews took place three times during the year, one in November 2010, one in February 2011 and the final interview in May 2011 (interview schedule Appendix 6). The aim of the interviews was to gain the students perspective of how the e-portfolio was implemented on this course. Seventeen students attended the interviews which were arranged in advance and a room booked on campus. The semi-structured interviews were digitally recorded, transcribed and a content analysis carried out. The topics emerged and these were organised under the same five category headings that emerged from the pilot, 'Academic Conditions', 'Experience', 'Scaffolding', 'System' and 'Technical Conditions'. In total 816 phrases were coded. As can be seen in Table 13 the categories 'Experience', 'Scaffolding' and 'System' had more coding than 'Academic Conditions' and 'Technical Conditions'.

Table 13. Frequency of occurrences of categories appearing in the interviews of the main study

Interview	'Academic Conditions'		'Experience'		'Scaffolding'		'System'		'Technical Conditions'	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
1st	29	32.6	69	30.7	50	22.0	102	47.0	49	74.2
2nd	42	47.2	35	15.6	38	16.7	61	28.1	6	9.1
3rd	18	20.2	121	53.8	139	61.2	54	24.9	11	16.7
Total	89	100.0	225	100.0	227	100.0	217	100.0	66	100.0

Table 13 contains an interesting pattern. The main emphasis of the first interview was on the 'System' and 'Technical Conditions'. The emphasis then shifted towards the 'Academic Conditions' in the second interview, and finally the third interview was more about the 'Experience' and 'Scaffolding'. This pattern suggested that the students initially focused on the tool, then their focus became the academic aspects of the course, and finally they reflected on their experience over time and the support they had received. This reflects the process across time from the students' perspective with 81.6 per cent positive comments. 'Academic Conditions' received a closer balance between frequency of positive and negative comments. When considering the percentage of overall negative comments those for 'Academic Conditions' accounted for 26.7 per cent, the other category with a high percentage of overall negative comments was 'System' (48.7 per cent). The negative comments for the 'Academic Conditions' related to expectations and workload, as discussed below. The positive comments regarding 'Experience' and 'Scaffolding' referred to understanding the purpose (see 5.2, 5.3 for discussion of whether purpose was actually understood) and a preference for working online together with feeling well supported by the teaching team, also discussed below. This was reportedly due to the tutors' expertise in using the e-portfolio tool and being able to quickly resolve any technical issues by providing individual training and advice as and when needed. The tutors were also perceived to provide, in most cases, support through feedback on the e-portfolio (Table 14).

Table 14 Frequency of occurrences of positive and negative student comments by category in main study

Student interviews	Positive		Negative		Total	
Categories	Freq	%	Freq	%	Freq	%
'Academic Conditions'	49	55.0	40	44.9	89	100
'Experience'	202	89.8	23	10.2	225	100
'Scaffolding'	218	96.0	9	3.9	227	100
'System'	136	65.1	73	34.9	209	100
'Technical Conditions'	61	92.4	5	7.6	66	100
Total frequency positive/negative and % of total frequency	666	81.61	150	18.38	816	100

As can be seen in Figure 4 the majority of total coding for the individual categories indicated a positive experience. The negative comments become more prolific during the second round of interviews when the students had experience of using the e-portfolio for five months. This will be analysed in the following sections.

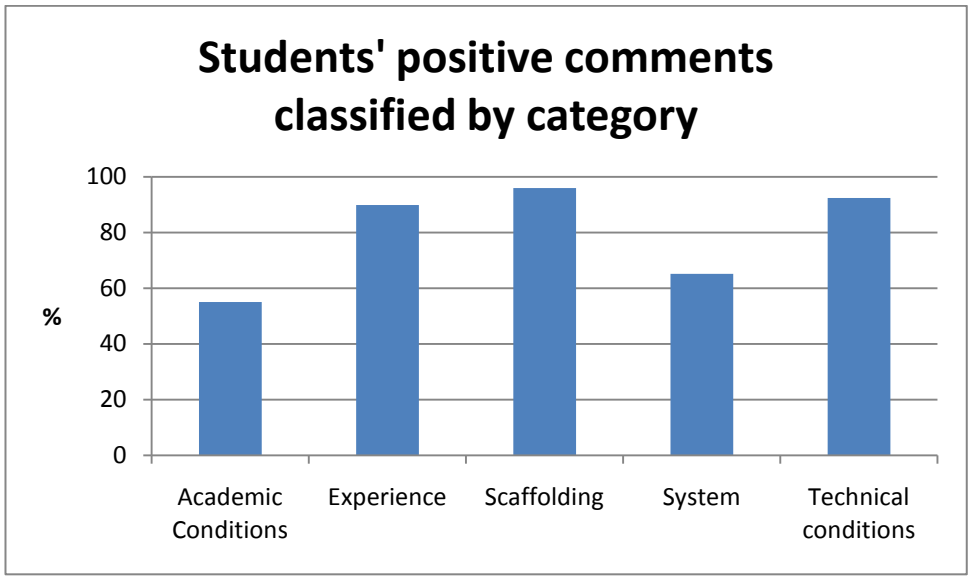


Figure 4. Students' positive comments classified by category

'Academic Conditions'

During the first interview the students were positive about the work on the e-portfolio as they felt the expectations of the course were clear, although a few comments were made

on not fully understanding what was expected (Table 15). Over half of the comments (58.6 per cent) made during this interview concerned the expectations of the course.

The negative comments increased in the second interview indicating that as the course progressed the students became less clear of what they were expected to do such as:

> "What I don't understand is the difference between professional level and Masters",
>
> "It's all a bit ambiguous",
>
> "It's a bit unclear and it has caused me a lot of confusion"
>
> "It's a bit unclear, it's been fairly successful but it's caused me a lot of confusion."

This was compounded by multi-faceted nature of the work to be completed:

> "At the beginning it's just nightmarish everything is just thrown at you".

There was a realisation that part of the problem stemmed from students' inexperience:

> "At the start it is all a bit overwhelming and you couldn't perhaps see the bigger picture".

Table 15. Frequency of occurrences of positive and negative student comments in the category 'Academic Conditions' in three interviews

Students – 'Academic Conditions'	1st Interview		2nd Interview		3rd Interview		Total	
Topics	Freq	%	Freq	%	Freq	%	Freq	%
CPD positive	0	0.0	2	4.8	5	27.8	7	7.9
CPD negative	0	0.0	1	2.4	0	0.0	1	1.1
Deadlines positive	1	3.5	1	2.4	0	0.0	2	2.3
Expectations positive	17	58.6	6	14.3	0	0.0	23	25.8
Expectations negative	3	10.3	12	28.6	0	0.0	15	16.9
Pedagogy positive	0	0.0	2	4.8	0	0.0	2	2.3
Reflections positive	0	0.0	9	21.4	0	0.0	9	10.1
Reflections negative	0	0.0	6	14.3	0	0.0	6	6.7
Workload positive	5	17.2	0	0.0	1	5.6	6	6.7
Workload negative	3	10.3	3	7.1	12	66.7	18	20.2
Total freq for interview and % of total frequency	29	32.6	42	47.19	18	20.2	89	100.0

The increase in negativity of expectations may be connected to the comments on the reflections. Whilst more positive comments were made than negative in the second interview, all the negative comments on the reflections were made at this time. These comments concerned the uncertainty of how they should reflect and the need for guidance and a clear structure, to enable them to reflect to satisfy the assessment criteria. With regards to style of writing some remarked that:

> "I find myself wanting to write an essay, it's just that style you need to get used to"

and:

> "Hard to switch to this kind of writing".

Contrasting perspectives were expressed on how tutors expected the work on the e-portfolio to resemble a journal or diary such as:

> "It is not structured like a diary, I'm not sure where to put anything, if I need to just record, where does it go how do you know where it fits in, is it this theme or that theme"

and:

> "It's not a journal of your experiences".

This was contrasted by comments such as:

> "I feel it is almost like a diary and you can access it, what prevents it becoming a diary is glitches in the software preventing this"

and,:

> "I write it as a blog first".

Some students explained the process they had adopted:

> "I get all my reading done and all the theory and then I relate my reflections to the theory"

and,

> "I put all my references on there and a couple of weeks later write reflections".

Whilst others felt the use of an e-portfolio did not help with reflection:

> "When you have reflections you need to do it instantly so by the time you get to a computer it's gone".

The workload was viewed with caution on the first interview with some positive and some negative comments. However, by the third interview sixty-seven per cent negative workload comments were expressed (Figure 5). By this stage of the course the students felt overwhelmed by the amount of work, but felt that the use of the e-portfolio was influencing their continuing professional development. By the third interview all students reported that they did not see the need to use the e-portfolio after the course ended as they had copied the work on a pen drive or on a computer.

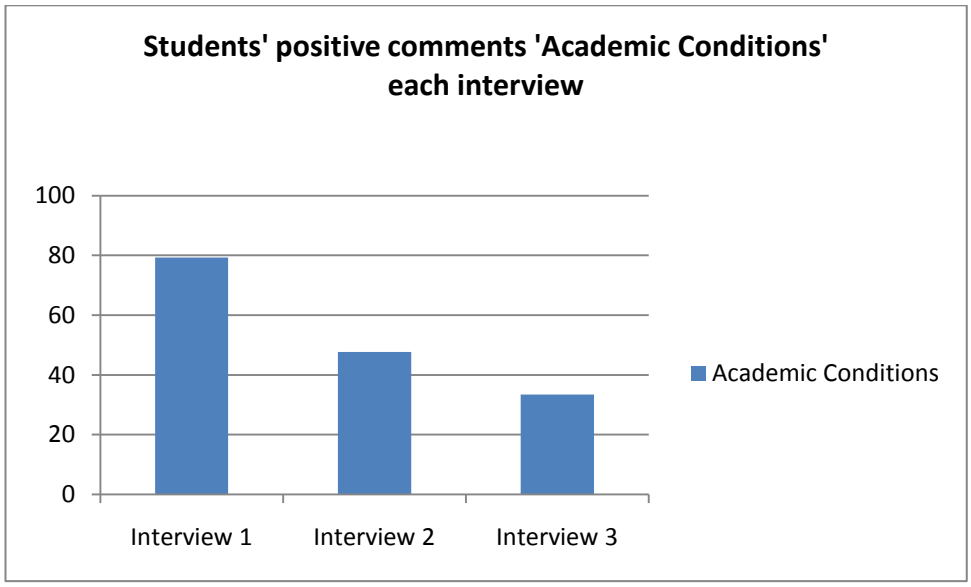


Figure 5. Students' positive comments 'Academic Conditions each interview

'Experience'

In this category the students talked about the experience of using the e-portfolio, their confidence working on the e-portfolio and preference of working online. In addition, how motivated they were to use the e-portfolio, the relationship with the tutor, having the necessary skills and how they used the e-portfolio whilst on placement. During the first

interview students commented on how their previous experience of using technology had assisted them in understanding how to work with the e-portfolio. They understood the purpose of the e-portfolio as a way for tutors to have easy access to their work and be able to support them with feedback. In addition, they considered:

"It is quite nice to know the work is all in one place"

And:

"It is useful because I can get it (work) up there quickly and someone can read it".

The students preferred using the e-portfolio rather than paper as they saw the benefits of easy access both by themselves and the tutors:

"You don't have to carry it around and can access it from anywhere".

It was accepted, and understood, by all the students that the adoption of the e-portfolio was connected to the administration of the course. The primary purpose was seen to be a vehicle to submit work for feedback and assessment. Although one student commented that:

"It's to be more aware of reflective practice and in that case I think it works".

The positive comments regarding use in placement came at the beginning of the course, this was before they had experienced placements where they were expected to teach rather than just observe. In the second interview the negative comments followed a placement where their teaching workload had increased, they reported:

"I didn't go on e-portfolio because it's all focussing on school work"

"Haven't been in very much because of being in placement"

and:

"Very little done while in school there is just no time".

During the third interview no negative comments were made in this category (Table 16).

Table 16. Frequency of occurrences of positive and negative student comments in the category 'Experience' in three interviews

Students – 'Experience'	1st Interview		2nd Interview		3rd Interview		Total	
Topics	Freq	%	Freq	%	Freq	%	Freq	%
Confidence positive	0	0.0	0	0.0	10	8.3	10	4.4
Motivation positive	1	1.5	0	0.0	28	23.1	29	12.9
Motivation negative	0	0.0	1	2.9	0	0.0	1	0.4
Preference positive	12	17.4	4	11.4	19	15.7	35	15.6
Preference negative	0	0.0	2	5.7	0	0.0	2	0.9
Previous experience Positive	14	20.3	0	0.0	2	1.7	16	7.1
Purpose positive	18	26.1	2	5.7	2	1.7	22	9.8
Relationships positive	0	0.0	2	5.7	33	27.3	35	15.6
Relationships negative	0	0.0	4	11.4	0	0.0	4	1.8
Skills positive	0	0.0	3	8.6	24	19.8	27	12.0
Skills Negative	3	4.4	1	2.9	0	0.0	4	1.8
Use in placement positive	20	29.0	5	14.3	3	2.9	28	12.4
Use in Placement negative	1	1.5	11	31.4	0	0.0	12	5.3
Total freq for interview and % of total frequency	69	30.7	35	15.6	121	53.8	225	100.0

The comments regarding relationships concerned the mode of giving feedback through the e-portfolio, not the value of the feedback. For example:

> "I need more quality reassurance from somebody face to face"
>
> "It's quite difficult sometimes when you have electronic feedback, I don't know what they mean"
>
> "Although it is good to have feedback all in one place I do like face to face mentoring".

Also as pointed out:

> "There is a place for e-learning but there needs to be a cut off point because you need to know what a person is like".

As can be seen from Figure 6 in interviews one and three the students expressed positive comments regarding the experience of using the e-portfolio. However, in the second interview over half of the comments were negative, as indicated above this may have been due to the workload at the time of interview.

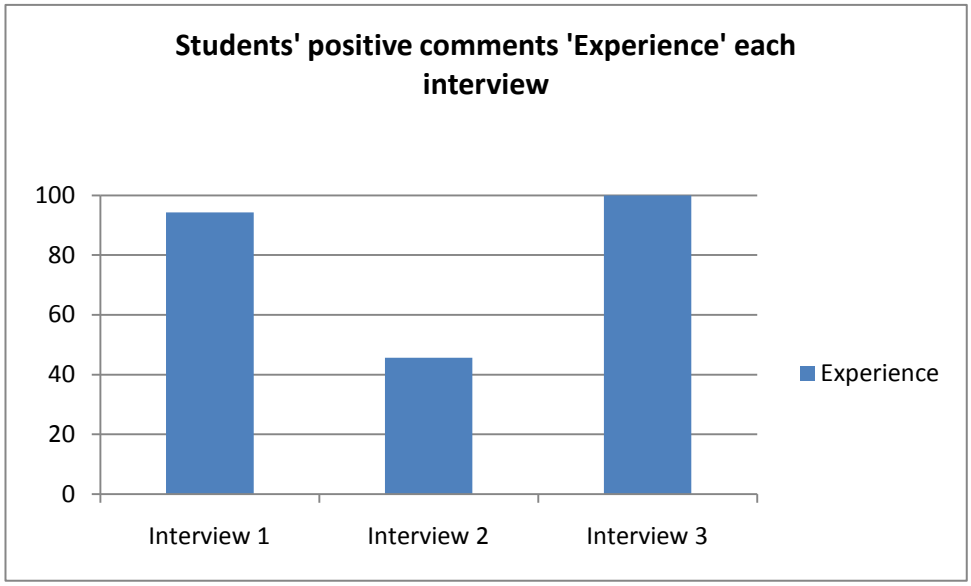


Figure 6. Students' positive comments 'Experience' each interview

'Scaffolding'

In the three interviews students were positive about the support they received to scaffold their learning (Table 17). They felt fully supported by tutors. The negative comments that appeared in the second interview concerned the inequality felt by some students over the way in which they received feedback, both in the frequency and the way this was achieved. Some students felt the feedback was:

"Very de-motivating, a bit demoralising"

This was because students felt they had worked so hard and the feedback appeared to be negative, this may link to relationships. Some students had not received feedback on the e-portfolio at this stage, and some had received feedback via email rather than the e-portfolio. The view was expressed that all tutors should work in the same way to ensure all students were treated equally. However, overall the majority of comments with regards feedback were positive such as:

"Motivated yeah, I mean I am on the right lines".

They commented that the most useful way of receiving feedback was by the tutor selecting a different coloured font and then placing comments throughout the text. This enabled them to see what part of the text the feedback referred to. In addition, the way a tutor gave the feedback helped to build up a close relationship. It was suggested by students that if tutors gave feedback throughout work using different coloured pens it could be very useful:

> "This was really useful, it felt like a delayed conversation, it really does feel like face to face".

Comments at the end of the text were not as useful as the students could not always understand what particular part of the text the tutor was referring to. Although some students felt overwhelmed by seeing many comments and one referred to this as being back at school and seeing the:

> "Red pen"

and another:

> "It's annoyed me that he (the tutor) had made so many comments".

Table 17. Frequency of occurrences of positive and negative student comments in the category 'Scaffolding' in three interviews

Students – 'Scaffolding'	1st Interview		2nd Interview		3rd Interview		Total	
Topics	Freq	%	Freq	%	Freq	%	Freq	%
Feedback positive	29	58.0	17	44.7	58	41.7	104	45.8
Feedback negative	0	0.0	7	18.4	0	0.0	7	3.1
From Peers positive	13	26.0	6	15.8	33	23.7	52	22.9
Support from tutor positive	8	16.0	6	15.8	48	34.5	62	27.3
Tutor support negative	0	0.0	2	5.36	0	0.0	2	0.9
Total freq for interview and % of total frequency	50	22.0	38	16.7	139	61.2	227	100.0

Students valued the support they received from their peers on how to use the e-portfolio although this support was through a social networking site, Facebook. It was not possible

for peers to give feedback on the e-portfolio due to the way the e-portfolio was set up.

The students felt using Facebook was useful because:

> "Lots of people use Facebook which does work for sharing ideas and have a moan".

This category indicated that the students were positive about how they were supported by the tutors through the e-portfolio (Figure 7).

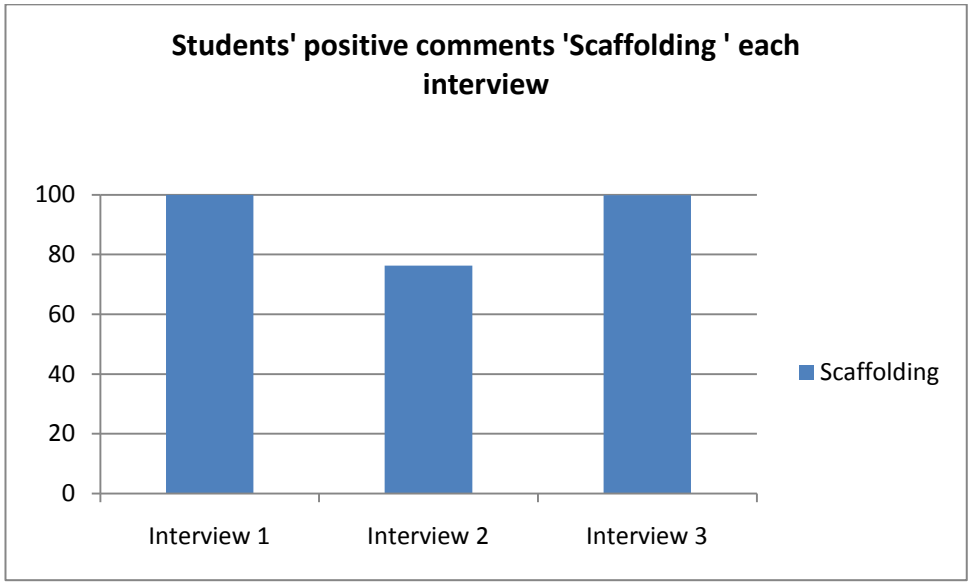


Figure 7. Students' positive comments 'Scaffolding' each interview

'System'

The students found the e-portfolio system easy to use as it was part of the University VLE, a website they frequently used to gain access to their email and access to all course documentation. Therefore, the comments regarding accessibility, ease of use, and the positive comments on issues with the system related to how convenient the students found the system to be. The positive comments regarding ease of use totalled 31.34 per cent of the overall comments in this category. The negative comments regarding issues with the system increased over the duration of the course (Table 18).

Table 18. Frequency of occurrences of positive and negative student comments in the category 'System' in three interviews

Students – 'System'	1st Interview		2nd Interview		3rd Interview		Total	
Topics	Freq	%	Freq	%	Freq	%	Freq	%
Accessibility positive	0	0.0	2	3.3	0.0	0.0	2	1.0
Accessibility negative	0	0.0	0	0.0	1	2.2	1	0.5
Ease of use positive	37	36.3	26	42.6	5	10.9	68	32.5
Ease of use negative	3	2.9	21	34.4	6	13.0	30	14.4
Issues with system positive	43	42.2	3	4.9	2	4.3	48	23.0
Issues negative	0	0.0	5	8.2	31	67.4	36	17.2
Ownership positive	17	16.7	0	0.0	1	2.2	18	8.6
Ownership negative	0	0.0	1	1.6	0	0.0	1	0.5
Reliability negative	2	2.0	3	4.9	0	0.0	5	2.4
Total freq for interview and % of total frequency	102	48.8	61	29.2	46	22.0	209	100.0

These referred to how difficult it was to navigate from one section to another and that a search engine would be useful. Also it was difficult to understand what they needed to do as it appeared as sections were hidden:

> "It's quite scary to look at, but you soon get used to it",
>
> "Difficult to navigate around to all the various wikis it is difficult"
>
> "Difficult to find things but I suppose the more you use it the easy it becomes".

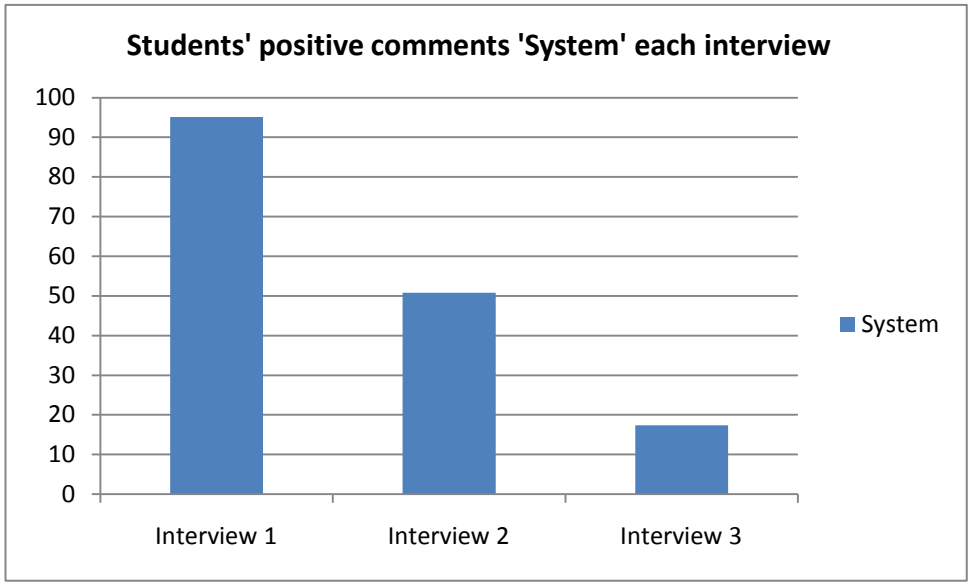


Figure 8. Students' positive comments 'System' each interview

In the third interview they also discussed the design of the e-portfolio and how this could be simplified, and, that the e-portfolio would benefit from a flagging system to alert the user of changes and to signpost the change. As Figure 8 indicates the positive comments declined as the course progressed indicating that the students became more aware of the flaws in the system with experience of use. However, as concluded by one student talking about how to use the e-portfolio tools:

> "I think it's my own laziness because had I been really bothered I would have worked it out myself".

Overall the system received more positive comments, however the negative issues accounted for 34.93 per cent of the overall comments.

The comments about the system at the end of the course indicated how the students had reflected and their view had changed overtime:

> "I can't fault this system because at first I was very sceptical but now I would say it is good".

One recurring issue concerned the way in which the word processor on the system was not compatible with Microsoft Word. Students commented on how inconvenient and

time consuming the editing process was if they copied and pasted work from Microsoft Word onto the e-portfolio as they had to edit the text to resolve the formatting issues that occurred.

Ownership of the e-portfolio was not an issue for the students, they did not feel that they needed to control when the tutor had access to their work:

> "I choose what I want to put on the e-portfolio"
>
> "I keep it all on a memory stick and then upload when it needed to be seen"
>
> "Why would it bother me that the tutor can see what I am doing"

'Technical Conditions'

These comments concerned the students' views on how they were supported technically within the University. They felt positive about the technical support on campus, expressed an opinion that they had the necessary skills to use the technology, the support from tutors was positive and the majority of total comments (51.5 per cent) regarding training was also positive (Table 19). However when looking at the percentages of negative comments in each interview, by the second interview the students commenting negatively on the training they received (see Figure 9). There were a small number (7.58 per cent) of negative comments regarding training. These came from students who considered that they had not had sufficient training, even though no negative comments regarding their skills were mentioned. Some students felt that it would be:

> "Better at the beginning to have more training in small groups".

Table 19. Frequency of occurrences of positive and negative student comments in the category 'Technical Conditions' in three interviews

Students – 'Technical Conditions'	1st Interview		2nd Interview		3rd Interview		Total	
Topics	Freq	%	Freq	%	Freq	%	Freq	%
In University positive	4	8.2	1	16.7	0	0.0	5	7.6
Skills positive	6	12.2	0	0.0	3	27.3	9	13.6
Support positive	11	22.5	2	33.3	0	0.0	13	19.7
Training positive	26	53.1	0	0.0	8	72.7	34	51.5
Training negative	2	4.1	3	50.0	0	0.0	5	7.6
Total freq for interview and % of total frequency	49	72.2	6	9.1	11	16.7	66	100.0

One problem with using multiple devices for receiving messages came from students who use their mobile telephone to receive emails. Students felt that the ease of reading emails on mobile devices meant they did not log on to the VLE as often as they needed.

As a result of this they did not check their e-portfolio as regularly as they should and therefore acknowledged that they:

> "Don't always see the information".

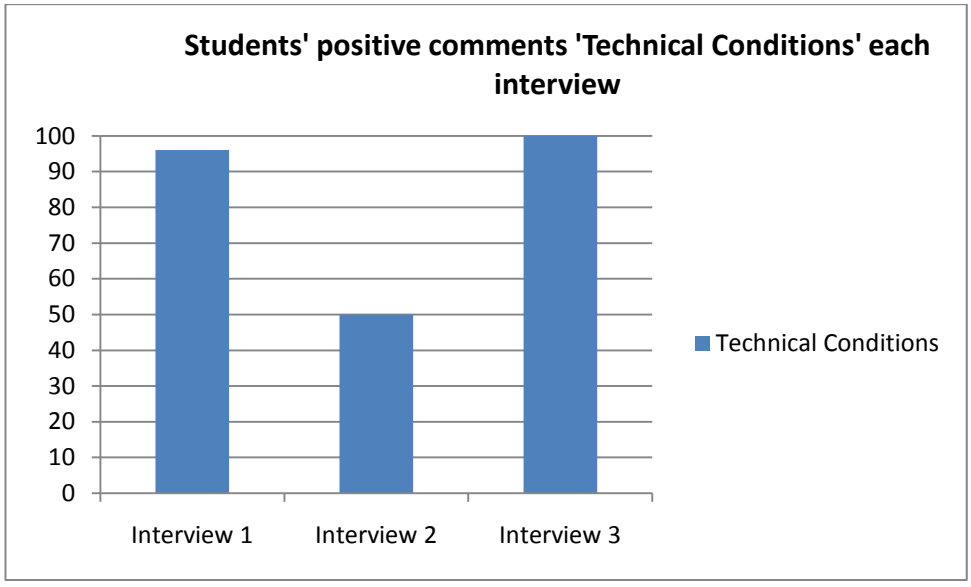


Figure 9. Students' positive comments 'Technical Conditions' each interview

5.4.1 Positive and negative comments

When considering the pattern of positive and negative comments over the three interviews it appeared that the negative comments were made following the use of the e-portfolio (Table 20). With experience of using the e-portfolio the students began to discover where the e-portfolio could be improved to make their overall experience more positive, showing how with experience their perception changed over time (Figure 10).

Table 20. Total frequency of occurrences of positive and negative student comments for the five categories in three interviews

	1st Interview				2nd Interview				3rd Interview			
	Positive		Negative		Positive		Negative		Positive		Negative	
Categories	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
'Academic Conditions'	23	8.2	6	35.3	23	22.6	19	23.8	6	2.1	12	24.0
'Experience'	65	23.1	4	23.5	16	15.7	19	23.8	121	42.5	0	0.0
'Scaffolding'	50	17.7	0	0.0	29	28.4	9	11.3	139	48.8	0	0.0
'System'	97	34.4	5	29.4	31	30.4	30	37.5	8	2.8	38	76.0
'Technical conditions'	47	16.7	2	11.8	3	2.9	3	3.8	11	3.9	0	0.0
Total	282	34.6	17	2.1	102	12.5	80	9.8	285	34.9	50	6.1

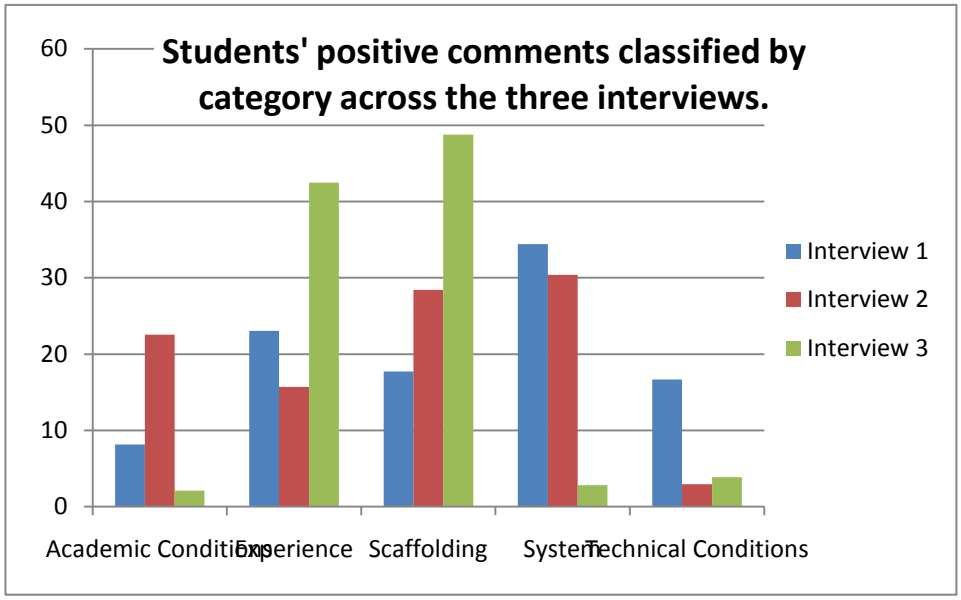


Figure 10. Students' positive comments classified by category across the three interviews

5.5 Tutor interviews

Tutor interviews took place three times during the academic year, see Appendix 6 for interview schedule. The six tutors agreed to participate in the research, however due to ill health one tutor was not available for the duration of the course. The semi-structured interviews took place in the tutor's individual office, were digitally recorded, transcribed and a content analysis carried out. The content analysis was organised under the same five category headings as for student interviews: 'Academic Conditions', 'Experience', 'Scaffolding', 'System' and 'Technical Conditions'. In total 322 phrases were coded. 'System' category comments were the most frequent during the first interview. (Table 21). This was, in part, due to the tutors referring back to the previous year and comparing the newly adopted e-portfolio to the e-portfolio platform used during the pilot year. This new e-portfolio design was considered to be technically speaking 'a major step forward'.

Table 21. Frequency of occurrences of positive and negative tutor comments in each category

Category	Positive		Negative		Total	Total
	Freq	%	Freq	%	Freq	%
'Academic Conditions'	51	68.0	24	32.0	75	23.3
'Experience'	40	95.2	2	4.8	42	13.0
'Scaffolding'	66	89.2	8	10.8	74	23.0
'System'	76	73.1	28	26.9	104	32.3
'Technical Conditions'	21	77.8	6	22.2	27	8.4
Total frequency for interview and % of total frequency	254	78.9	68	21.1	322	100.0

The frequencies and percentages of comments under each category are shown in Table 22. This gives the frequency and percentage for each category across the three interviews giving an indication of the importance of each category in relation to point in the course.

Table 22. Frequency of occurrences of comments in each category in three interviews

Interview	'Academic'		'Experience'		'Scaffolding'		'System'		'Technical Conditions'		
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Total
First	11	14.7	5	11.9	30	40.5	61	58.7	17	63.0	124
Second	13	17.3	26	61.9	20	27.0	19	18.3	2	7.4	80
Third	51	68.0	11	26.2	24	32.4	24	23.1	8	29.6	118
Total	75	23.3	42	13.0	74	23.0	104	32.3	27	8.4	322

When comparing the positive and negative comments across the three interviews it is apparent that as the course progressed the tutors reflected on the year and were able to highlight areas for improvement (Figure 11). In all categories the percentage of negative comments increased.

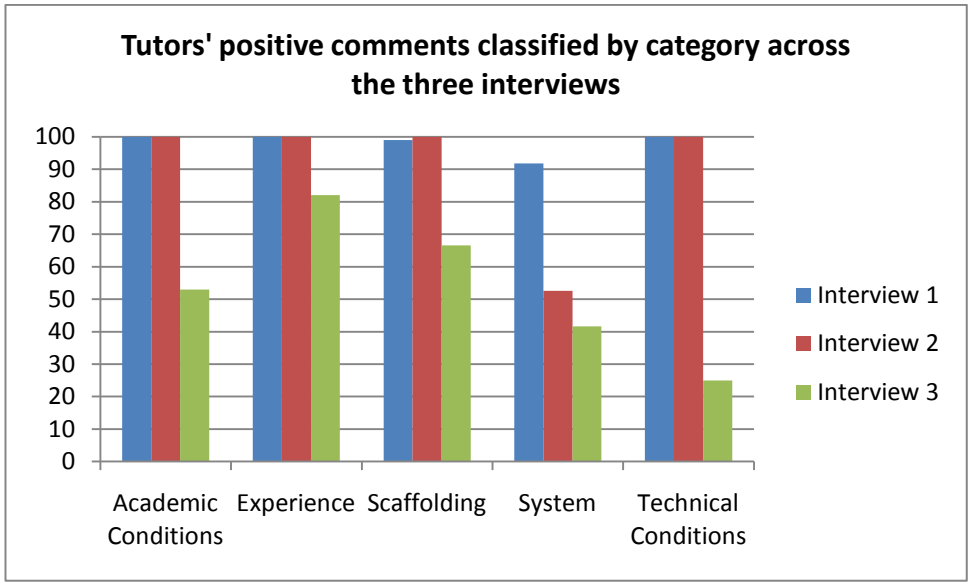


Figure 11. Tutors' positive comments classified by category across the three interviews

'Academic Conditions'

In the first interview the tutors commented positively on how, by using the e-portfolio, students were able to understand clearly the expectations of the course, with one comment expressing an opinion on the realistic workload. It was felt that the design of the e-portfolio clearly mapped out the course in its entirety. This pattern of comments was repeated in interview two with the addition of two comments stating how the use of the e-portfolio positively influenced the continuing professional development of the students. By the third interview tutors were able to reflect on the academic year and acknowledged that whilst the content on the e-portfolio allowed students to see the totality of the expectations, there were too many different elements to the course and the workload, whilst achievable, put too heavy a burden on students. The result of this, according to tutors, was that whilst all students were able to record their reflections they were not all achieving the expected depth of reflection. Some students were, through the process of reflecting and recording these reflections on the e-portfolio, improving with

regards to their style of writing, but not necessarily at reflective practice. Although not all tutors agreed that their group of students' style were improving:

> "They are struggling with different forms of writing and as a result there is no clear line of development."

The view of the tutors was that students were not achieving the depth of reflection expected. This was attributed to the e-portfolio as a tool:

> "The presentation of a piece of reflective writing was not 100 per cent supported by different pieces of evidence and I think it was very difficult for them to reflect without having a particular…. well piece of evidence to talk about and I realise that probably that might have influenced the level of their reflection, that was the most striking feature, the e-portfolio did not allow this."

> "It (e-portfolio) doesn't serve the purpose, they don't go deep enough."

Or as another tutor suggested, how the students approached the work was the cause of lack of depth in reflection:

> "...rather than looking at a reflection on a particular theme over a long period of time what's here is a theme, reflect upon it".

However, many students were attempting to write an essay and approaching this in a similar way to assignment writing and this did not enable them to meet the outcomes of in-depth reflective practice. The final tutor interview accounted for sixty-eight per cent of the coding in the 'Academic Conditions' category (Table 23).

Table 23. Frequency of occurrences of positive and negative tutor comments in the category 'Academic Conditions' in three interviews

Tutors – 'Academic Conditions'	1st Interview		2nd Interview		3rd Interview		Total	
	Freq	%	Freq	%	Freq	%	Freq	%
CPD positive	0	0.0	2	15.4	0	0.0	2	2.7
Deadlines positive	0	0.0	0	0.0	0	0.0	0	0.0
Expectations of course positive	10	90.9	10	76.9	6	11.8	26	34.7
Expectations negative	0	0.0	0	0.0	10	19.6	10	13.3
Pedagogy positive	0	0.0	0	0.0	8	15.7	8	10.7
Reflections positive	0	0.0	0	0.0	11	21.6	11	14.7
Reflections negative	0	0.0	0	0.0	9	17.7	9	12.0
Workload positive	1	9.1	1	7.7	2	3.9	4	5.3
Workload negative	0	0.0	0	0.0	5	9.8	5	6.7
Total freq for interview and % of total frequency	11	14.7	13	17.3	51	68.0	75	100.0

'Experience'

Within this category tutors remarked on how, through the use of the e-portfolios, the students were motivated to complete the work, with only one comment regarding the de-motivational aspect of working online for some students. The majority of comments in this category appeared during the second interview when the students had been using the e-portfolio for five months (Table 24). At this time tutors commented on their preference for working online and how the students understood the purpose of using the e-portfolio to develop their reflective practice.

Table 24. Frequency of occurrences of positive and negative tutor comments in the category 'Experience' in three interviews

Tutors – 'Experience'	1st Interview		2nd Interview		3rd Interview		Total	
	Freq	%	Freq	%	Freq	%	Freq	%
Confidence positive	2	40.0	1	3.9	0	0.0	3	7.1
Motivation positive	1	20.0	9	34.6	1	9.1	11	26.2
Motivation negative	0	0.0	0	0.0	1	9.1	1	2.4
Preference positive	0	0.0	9	34.6	0	0.0	9	21.4
Purpose positive	1	20.0	5	19.2	0	0.0	6	14.3
Relationships positive	0	0.0	0	0.0	7	63.6	7	16.7
Relationships negative	0	0.0	0	0.0	1	9.1	1	2.4
Skills positive	0	0.0	0	0.0	1	9.1	1	2.4
Use in placement positive	1	20.0	2	7.7	0	0.0	3	7.1
Total freq for interview and % of total frequency	5	11.9	26	61.1	11	26.2	42	100.0

With regards to working on 'Themes and Issues' the tutors agreed that the students did not work on these whilst on placement, expressing comments such as:

> "So their priority isn't reflection it's getting everything perfect in school."
>
> "The actual connectivity between the two was just not there."

By the third interview tutors mentioned how using the e-portfolio had enabled them to build up a good working relationship with the students, with one negative comment regarding the clinical nature of working online. This was seen by one tutor as a negative aspect when compared to face to face meetings.

'Scaffolding'

Tutors commented favourably on how giving feedback through the e-portfolio was an efficient and effective way of providing scaffolding as the more informed other. It was their perspective that feedback enabled the students to improve their work. However, it was acknowledged that it was difficult for the students to go back to the original work and make changes as this would result in them having to almost start again. Feedback was not intended as a proof reading exercise, but as giving guidance on improvement. The feedback was used by students when completing other pieces of work. Twenty-four positive comments were made with regards to feedback and there were seven negative

comments (Table 25). Feedback by tutors was seen to have a positive effect with regards to the quality of the writing but it was acknowledged that every time feedback was given it created more work for students and perpetuated a climate where work was never finished. Also the way in which the student uploaded documents caused issues in the ability to efficiently give feedback. If the student used the word processor on the e-portfolio this was a relatively easy exercise. However if they uploaded a Microsoft Word document the tutor would have to download this, make amendments, and then upload the edited document taking a considerable amount of time.

Table 25. Frequency of occurrences of positive and negative tutor comments in the category 'Scaffolding' in three interviews

Tutors – 'Scaffolding'	1st Interview		2nd Interview		3rd Interview		Total	
	Freq	%	Freq	%	Freq	%	Freq	%
Feedback positive	13	43.3	2	10.0	9	37.5	24	32.4
Feedback negative	0	0.0	0	0.0	7	29.2	7	9.5
From peers positive	1	3.3	1	5.0	5	20.8	7	9.5
Support from tutor positive	10	33.3	2	10.0	2	8.3	14	18.9
Tutor support negative	0	0.0	0	0.0	1	4.2	1	1.4
Tutor experience positive	6	20.0	15	75.0	0	0.0	21	28.4
Total freq for interview and % of total frequency	30	40.5	20	27.02	24	32.4	74	100.0

Most of the comments in this category were made during the first interview at a time when the tutors were just beginning to give feedback to the students. All negative comments appeared during the third interview. This was when tutors were able to consider the issues having had nine months experience. In May they were able to make reflective judgements based on the e-portfolio as an effective vehicle for providing scaffolding.

'System'

In this category comments regarding the actual e-portfolio system were discussed. These concerned how accessible it was to students and tutors, how easy it was to use, system issues with regards to the e-portfolio as a tool, the subject of ownership and any perceived

technical issues (Table 26). The majority of the comments were made during the first interview. This might be due to the prior negative experience discussed in the introduction to this section. Most comments related to how easy the system was to use, although more negative remarks appeared at the final interview where the limitations of the system were acknowledged with regards to navigation. As this e-portfolio was part of the University VLE, it was considered technically sound. The negative aspects related to the design of the e-portfolio. For instance it was acknowledged by some tutors that students were not making connections between the different aspects of their work. This was, in part, due to the inflexibility of the e-portfolio and working with an e-portfolio for part of the requirements of the course and a paper portfolio for another. The adoption of the new system was perceived as successful however the design of the system needed attention, and the breadth of work the students needed to complete reduced. It was also acknowledged that tutors could not manage the expectations with regards to feedback using this system.

Table 26. Frequency of occurrences of positive and negative tutor comments in the category 'System' in three interviews

Tutors – 'System'	1st Interview		2nd Interview		3rd Interview		Total	
	Freq	%	Freq	%	Freq	%	Freq	%
Accessibility positive	0	0.0	1	5.3	0	0.0	1	1.0
Ease of use positive	25	41.0	3	15.8	5	20.8	33	31.7
Ease of use negative	1	1.6	1	5.3	3	12.5	5	4.8
Issues with system positive	5	8.2	2	10.5	0	0.0	7	6.7
Issues negative	4	6.6	8	42.1	1	4.2	13	12.5
Ownership positive	3	4.9	2	10.5	0	0.0	5	4.8
Reliability negative	0	0.0	0	0.0	10	41.7	10	9.6
Technical aspects positive	23	37.7	2	10.5	5	20.8	30	28.9
Total frequency for interview and % of total frequency	61	58.7	19	18.3	24	23.1	104	100.0

'Technical Conditions'

All tutors felt they had the skills, knowledge and understanding to use the e-portfolio effectively. If they required additional support they were able to call on the expertise of their colleagues (Table 27). The negative comments related to the skills of the students who did not appear to use the e-portfolio as effectively as they could. For instance, some students did not realise that they could take images of documents with a camera and upload these, or that through the e-portfolio they were able to hyperlink from one document to another. As a result the work on the e-portfolio appeared one dimensional losing the richness that was possible through hyper-linking and making connections.

Table 27. Frequency of occurrences of positive and negative tutor comments in the category 'Technical conditions' in three interviews

Tutor Interviews – 'Technical Conditions'	1st Interview		2nd Interview		3rd Interview		Total	
	Freq	%	Freq	%	Freq	%	Freq	%
Skills negative	0	0.0	0	0.0	6	75.0	6	22.2
Support positive	10	58.8	1	50.0	2	25.0	13	48.2
Training positive	7	41.2	1	50.0	0	0.0	8	29.6
Total frequency for interview and % of total frequency	17	63.0	2	7.4	8	29.6	27	100.0

5.6 Analysis of student e-portfolios

The individual e-portfolios were analysed to answer the research questions 'how are e-portfolios used by trainee teachers' with regards to interactions in this chapter and 'is there a relationship between the use of e-portfolios and the development of reflective learners' addressed in Chapter 6. The use by the student was investigated through analysis of the interactions the student had with the e-portfolio for both elements of the course, the 'Tasks' and the 'Themes and Issues'. Every time the student accessed their e-portfolio and made a change, however small, or viewed the e-portfolio it is considered an

interaction. This gave the frequency and also the context when these interactions took place. In addition, interactions from tutors to give feedback were also analysed.

Permission to analyse e-portfolios was sought by an announcement on the e-portfolio. Seventeen students responded and gave their permission. Of these seventeen, eleven were involved in the interview sample.

Explanation of 'Tasks 'and 'Themes and Issues'

As previously stated the e-portfolio was used for two elements of the course, 'Tasks' and 'Themes and Issues'.

The 'Tasks' (Appendix 16) were prescriptive and the students given clear instructions on what they needed to do, such as for task RJ1:

> 'Check who the designated Child Protection Person is in your school. Put a copy of the school's policy on safeguarding children in your webfolio. Annotate the policy to demonstrate your five key learning points - summarise them here.'
>
> (Primary PGCE Professional Development Profile – Reflective Practitioner Handbook 2010-11:37)

Completion was in the form of a product (written piece of work) concerned with teaching and learning. The twenty-six 'Tasks' that the students were required to complete included a pre-course task and subject audits with the remaining twenty-four falling into three categories, two subject curriculum areas (English and Mathematics) and one referred to as 'reflective journals'. 'Reflective journals' was an unfortunate title for these 'Tasks' as it caused confusion with the 'Themes and Issues' also described as a reflective journal but these are completely different activities (Appendix 15). The purpose of the reflective journal 'Tasks' as described in the course documentation was:

> 'To enable you to engage with a range of important current aspects of life in school and will help to give you a wider and deeper understanding of the complex nature of teaching and the multiplicity of a teacher's roles and responsibilities.'
>
> (Primary PGCE Professional Development Profile – Reflective Practitioner Handbook 2010-11:39)

The 'Themes and Issues' were areas for exploration, as a prompt for reflective thought. For instance, the instructions for 'What is Learning' state:

> 'Schools are places where learning takes place. But what do we really know about what learning actually is?
>
> What insights do different theoretical approaches give us as teachers?
>
> What do we know about the most effective pedagogical approaches to teaching?
>
> What is neuroscience telling us about the nature of learning, and what implications are there for pedagogy?
>
> Does the notion of 'learning styles' have any validity or usefulness?'
>
> (Primary PGCE Professional Development Profile – Reflective Practitioner Handbook 2010/11:37)

These wider educational issues are expressed as questions, open-ended with the student given the responsibility to interpret and respond (Appendix 15). The guidance for each 'Theme and Issue' clearly encouraged students to investigate education by considering the wider domain of education including research, policy, practice and child development. In contrast the 'Tasks' were activities to be completed by the student at the placement school. However, the expectation was that the students would receive formative feedback on the 'Themes and Issues' and they would work on these over the duration of the course. This would imply that there would not necessarily be one upload per element. For example on 24th November, 2010 the following announcement appeared on the e-portfolio:

> 'Over the next 3 weeks tutors will be looking at your M level themes in your journal and providing feedback and guidance. Select 2 themes which you wish your tutor to review and feedback on. Rename those themes with 'M level' at the start of their title, e.g. "M level What is Learning?" with immediate effect. The feedback is formative and will support you with your M level work for your journal.'
>
> (e-portfolio:2011)

All of the 'Tasks' related to the experiences of the students in school as explained on the e-portfolio as follows:

> ‘This section will enable you to engage with a range of important current aspects of life in school and will help to give you a wider and deeper understanding of the complex nature of teaching and the multiplicity of a teacher’s roles and responsibilities.
> You will need to plan carefully when you will do each task. We recommend that you do these ‘Tasks’, wherever possible, in the first part of the placements. Once the placement develops you will be teaching for a greater percentage of the week and it will be hard to find the time to complete the ‘Tasks’.’

(Primary PGCE Professional Development Profile – Reflective Practitioner Handbook 2010-11:39)

Whereas guidance for the ‘Themes and Issues’ stated:

> ‘This section asks you to reflect critically on a range of significant and current educational Themes and Issues, drawing on your wider reading of research and theory, University sessions and school experience. Although you will be writing in the first person, these sections are expected to be written in an appropriate academic style (for example using accurate and complete referencing).
>
> From the nine areas you will choose five to develop at Masters level. The other four can be presented at Professional level. Each section should be between 1000 and 2000 words.
>
> Each section has some prompts to help you get started on the topics, and to identify some possible relevant avenues to explore, but do not feel constrained by these. Resist the temptation to try to cover everything – reduce the range of topics you are discussing in order that you develop an in-depth discussion of issues that you consider to be important.’

(Primary PGCE Professional Development Profile – Reflective Practitioner Handbook 2010-11:37)

In summary the ‘Tasks’ were twenty-six activities set by tutors to be completed whilst on placements at specific times in the course. ‘Themes and Issues’ were the reflective writing the students completed as an ongoing element of the e-portfolio over the duration of the course.

5.6.1 How are e-portfolios used by trainee teachers?

Data were collected from the e-portfolio to ascertain the number of interactions and when these interactions took place in relation to the point of the course. As stated every time that a student accessed the e-portfolio and made a change, no matter how small, it was considered an interaction. The course was divided into the following contexts:-

- on placement
- on campus
- research weeks (four consecutive weeks)
- holiday periods

During the interviews the students reported that they used the e-portfolio over the duration of the course for the 'Tasks' set but mainly restricted their interactions on the 'Themes and Issues' to times when they were on campus, as noted below.

5.6.2 Student and tutor interactions on the e-portfolio

In total the seventeen students had 1,601 interactions with their e-portfolios over the duration of the course ranging from thirty-four to 208 interactions for individual students (Appendix 17). The total number of interactions per month by both students and tutors (Table 28) revealed that students were more active in October and November when they spent six weeks on campus and two weeks on placement, and usage declined in the next two months which included a period of four weeks on placement, one on campus and three weeks for the Christmas holiday. This supported the students' perception that most of the interaction with the e-portfolio takes place when they are not on placement. Over the Christmas holiday (a period away from the time pressures of placement and University) the total number of interactions by students was twenty-nine, not a period of increased activity.

Table 28. Frequency of occurrences of student and tutor interactions each month

	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July
Total student	86	197	207	83	57	179	111	214	274	191	2
Total tutor	6	15	3	17	17	3	43	8	13	82	0

As illustrated in Figure 12, student activity peaked in February (179) and was followed by a peak in tutors activity (seventy-nine) in March, suggesting that students were uploading

files in readiness for a formative feedback point. The peaks in May (274) and June (191) for all students and June for all tutors (eighty-two) clearly revealed an increase in activity at the end of the course. The feedback received from tutors at the final feedback point would be at the end of the course this suggested a summative feedback point.

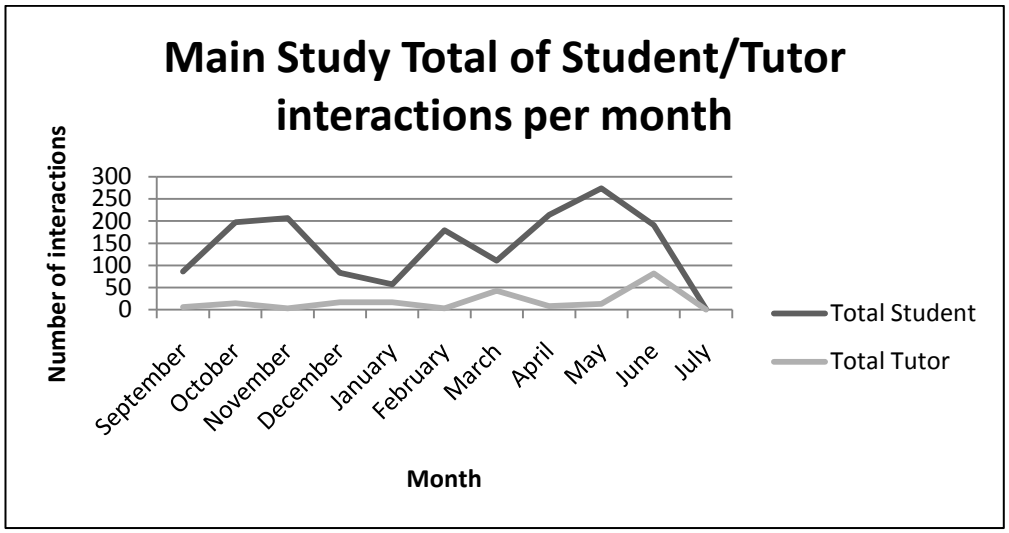


Figure 12. Main study total interactions by tutors and students per month of the course

The interactions for the whole of the e-portfolio by individual students were spread over the forty-five weeks (Appendix 18). This included the thirty-eight weeks of the course and holiday periods. This revealed peaks in activity during weeks commencing (w/c) 4th October, 15th November 2010, 14th February, 18th April, 30th May and 6th June 2011. Scrutiny of the course documentation shows that w/c 4th October, 15th November and 14th February corresponded to the first week on campus following a school placement, w/c 18th April and 30th May were holiday weeks, and w/c 6th June was the first week of a school placement but also the week when final assessments were taking place. The dip in w/c 24th February corresponded with the middle week with two weeks of school placement either side. This confirmed the students' perspective that interaction occurred whilst on campus. This indicated that the e-portfolio may have been perceived as campus work and not considered as an activity to be completed during school placement. Or

alternatively it may highlight the internet access problems that may have been encountered during placement. It also showed they increased their activity in some holiday weeks and also before the final assessment (Appendix 18).

5.6.3 Interaction by context

The 'Tasks' were set predominantly as fact finding exercises and activities to be completed during school placement with hand-in dates throughout the course, whereas it was expected that work on the 'Themes and Issues' would draw on experiences throughout the training period from school placements and information gained whilst in University. The hand-in for summative assessment in May/June was before the course ended on the 8th July. Total interactions by context and element of the work to be completed on the e-portfolio confirmed interview data (see Table 29).

Table 29. Frequency of occurrences of student sample interactions in each context

	On placement	%	On campus	%	On holiday	%	Study leave	%	Total	%
'Tasks'	494	31	387	24	216	13	60	4	1,157	72
'Themes/ Issues'	61	4	159	10	165	10	59	3	444	28
Total	555	35	546	34	381	24	119	7	1,601	100

During the training year the students spent thirteen weeks on campus, attending lectures and seminars, twenty weeks on school placement, eight weeks on holiday and four weeks on study leave. Table 30 shows the average number of interactions for the sample and average number of interactions for the group in the different contexts.

Table 30. Frequency of occurrences shown as an average for the student sample in the different contexts

Section	Students	Context			
		Placement (20 weeks)	On campus (13 weeks)	Holiday (8 weeks)	On study leave (4 weeks)
'Tasks'	Sample	24.7	29.7	27	15
	Individual	1.4	1.6	1.6	0.9
'Themes and Issues'	Sample	3.0	12.2	20.6	14.7
	Individual	0.2	0.7	1.2	0.9

5.6.4 Interactions with 'Themes and Issues' and 'Tasks'

It is clear from the analysis that the students interacted more on the 'Tasks' rather than the 'Themes and Issues'. This variation can be explained by there being twenty-six 'Tasks', whilst elements of the 'Themes and Issues' totalled only nine. It may also be attributed to the perception of the students that work on placement had a greater importance than the work carried out on campus.

What is interesting from the analysis in Appendix 18 is that the total percentage of student interactions on the 'Themes and Issues' range from fourteen per cent – forty-five per cent, the percentage range for 'Tasks' from fifty-five per cent – eighty-six per cent.

If students perceived all elements on the e-portfolio as equally important then 2.8 per cent (one-hundred per cent divided by thirty-six) of total interactions for each of the thirty-six elements would be expected. Therefore, total percentage for the 'Themes and Issues' would be twenty-five per cent and for the 'Tasks 'it would be seventy-five per cent.

From the seventeen e-portfolios analysed, three students fall within this pattern of having twenty-five per cent (+/- 10 per cent) and 74.5 per cent for 'Themes and Issues' and 'Tasks' respectively (Appendix 18).

If equal weighting was given to 'Themes and Issues' and 'Tasks' then fifty per cent of interactions for each element would be expected, with the nine areas on the 'Themes and Issues' attracting 5.6 per cent of interactions and twenty-six 'Tasks' 1.8 per cent each.

Student four revealed forty-five per cent/fifty-five per cent split between the two, this was the only student who was interacting on both 'Themes and Issues' close to equal weighting. However, given that five of the 'Themes and Issues' were at Masters Level it could be suggested that these would attract a higher level of importance and more interactions. This would suggest an hierarchy of importance according to level of assessment, five at Masters Level attracting double the interactions than those for the other areas, for example, one would expect to see 'Themes and Issues' with 34.2 per cent (4 x 2.4 per cent, 5 x 4.9 per cent) and 'Tasks' 63.4 per cent (26 x 2.4 per cent) of total interactions. Appendix 18 shows that for 'Themes and Issues' two students were within the range 30.7 – 37.6 per cent (34.2 +/- 10 per cent). These were students one and seventeen. For 'Tasks' five students were within the range 57.1 - 69.8per cent (63.4 per cent +/- 10 per cent) these were students one, twelve, thirteen, sixteen and seventeen.

Analysis of interactions by each student in the four contexts showed that students approached the two elements in a similar way (Tables 31 and 32). Those that worked more on one element worked at a similar level on the other element and vice versa. There is an association between the type of activity and the context. Hence, interactions with 'Tasks' are more frequent whilst in placement. This is important for the tutors to be aware of this in order that they may support students on 'Tasks' whilst in school. In addition, tutors need to be aware of the way in which students worked on 'Themes and Issues' more when on campus (35.8 per cent) and on holiday (37.2 per cent) than whilst on placement (13.7 per cent), and study leave (13.3 per cent). This analysis suggested students are not following the module guidelines and need more support on this work when they are on placement and study leave.

Table 31. Interactions by the seventeen students in the sample group in four contexts on 'Tasks' and 'Themes and Issues' – mean and standard deviation

Student Interactions	Mean	Std. Deviation	N*
Interactions on 'Themes and Issues'	6.5294	7.31074	68
Interactions on 'Tasks'	17.0147	14.20478	68

(*seventeen students in four different contexts)

Table 32. Interactions by the seventeen students in the sample group in four contexts on 'Tasks' and 'Themes and Issues' – correlation

Student Interactions		Interactions 'Themes and Issues'	Interactions 'Tasks'
InteractionsM	Pearson Correlation	1	.355*y
	Sig. (2-tailed)		.003
	N	68	68
InteractionsT	Pearson Correlation	.355**	1
	Sig. (2-tailed)	.003	
	N	68	68

(* Correlation is significant at the 0.01 level (2-tailed))

The Box and Whisker diagram (Figure 13) displays the range of interactions by students for both the 'Themes and Issues' and 'Tasks' in the four contexts. This agreed with the perception of the students that interactions with 'Themes and Issues' whilst on placement was minimal. The range of interactions on 'Tasks' was greater than that for the 'Themes and Issues' for the four contexts. This shows the range of interactions for 'Themes and Issues' was smaller and, therefore, students' number of interactions on this element of the work was less than that on the 'Tasks'. The exception was when students are on campus when the range of interactions was wide.

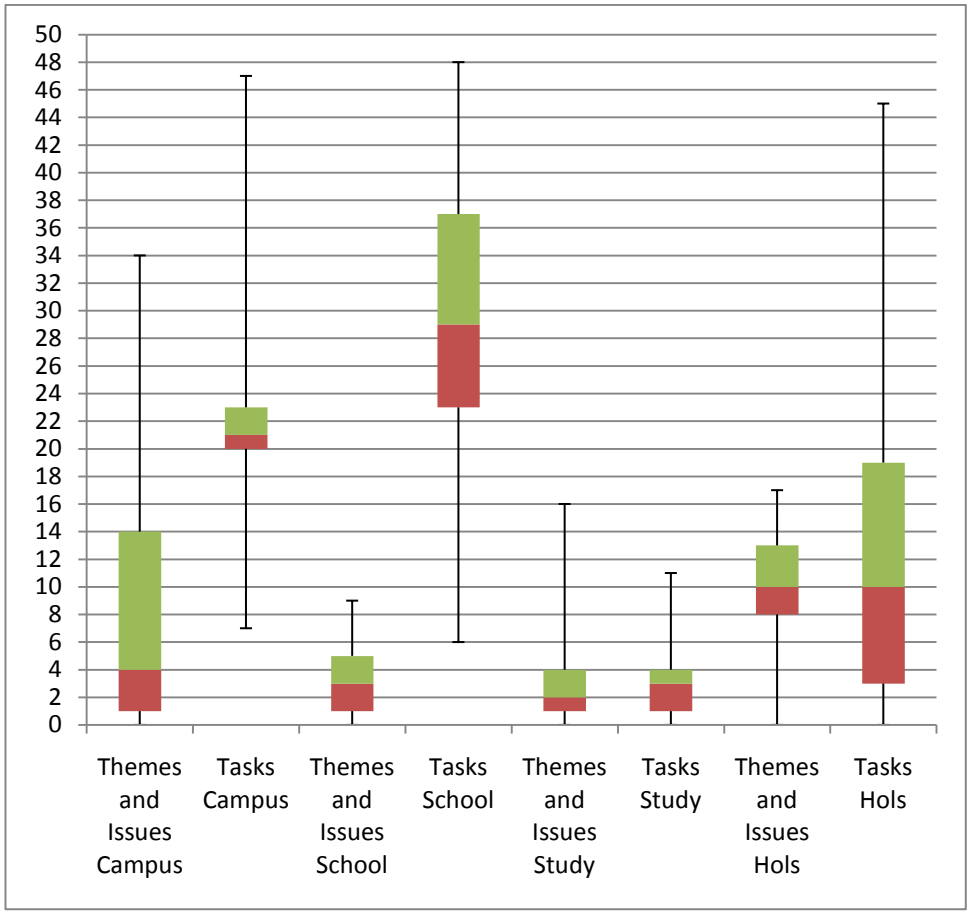


Figure 13. Box and Whisker diagram showing ranges of interactions on 'Themes and Issues' (RPM) and 'Tasks' in the four contexts

5.6.5 Student interactions - 'Themes and issues'

Following the guidance in the course documentation students were expected to interact weekly with this work. This would total 646 for the sample group (thirty-eight weeks x seventeen). The students actually made 444 interactions over the duration of the course ranging from three to sixty-six. What was interesting was why there should be this variance between students and what motivates one student to interact on more occasions. This was explored in the individual case studies, see Chapter 6.

The peak of interactions for the 'Themes and Issues' took place in w/c 30th May (see Figure 14) a holiday week followed by an assessment point. This totalled ninety-four interactions, twenty per cent of the total interactions on this course work for the whole of the sample. The other peak took place during w/c 21st February, the week before the research weeks and just before tutor feedback took place, this was when twenty-one per cent of the total number of tutor feedback took place. The other tutor feedback point took place in June when thirty-eight per cent of interactions occurred. This would suggest that student interactions may have been a result of expected assessment taking place. If they were using the e-portfolios to log their reflections over the duration of the course, as suggested in course documentation, one would expect to see a consistent number of interactions per month. This also suggested that rather than recording a learning journey the use of the e-portfolio by the students was for uploading files for assessment purposes.

The tutors were given a three week period in which to give feedback to students for each of the four formative assessment feedback points, as follows:-

Feedback Point 1 – w/c 11/10, 18/10, 25/10/10 (peak of student interactions 11/10/10)

Feedback Point 2 - w/c 29/11, 1/12, 13/12/10 (peak of student interactions 27/11/10)

Feedback Point 3 - w/c 28/2, 7/3, 14/3/11 (peak of student interactions 21/2/11)

Feedback Point 4 - w/c 13/6, 20/6, 27/6/11 (peak of student interactions 30/5/11).

The pattern of increased activity by the students at these points suggested they were uploading for the purpose of formative feedback for the first three feedback points, and completing their work for the final summative feedback point. If, as the module guide stated, they were expected to interact with this part of the e-portfolio on a weekly basis, the analysis would indicate that this is not the case. It is the use of the e-portfolio as an assessment tool that appears to be driving the use by the students. This suggested a

positivist paradigm, portfolio as a test, not as a portfolio using a constructivist paradigm, portfolio as a story (Barrett 2004). There is clear distinction between an e-portfolio as a reflection of the learning journey and assessment (Cohen 2005). The design of this e-portfolio allowed the student to respond to the instruction and guidance embedded within the content for the purpose of assessment. Assessment taking place using a hierarchical framework for grading the Masters element and formative taxonomy to guide students in how to achieve the levels of reflection. Although the completed e-portfolio was able to show an individual's learning journey, it was a learning journey recorded within defined expectations of what needed to be achieved by prescribed dates, and feedback encouraging a particular structure for the writing.

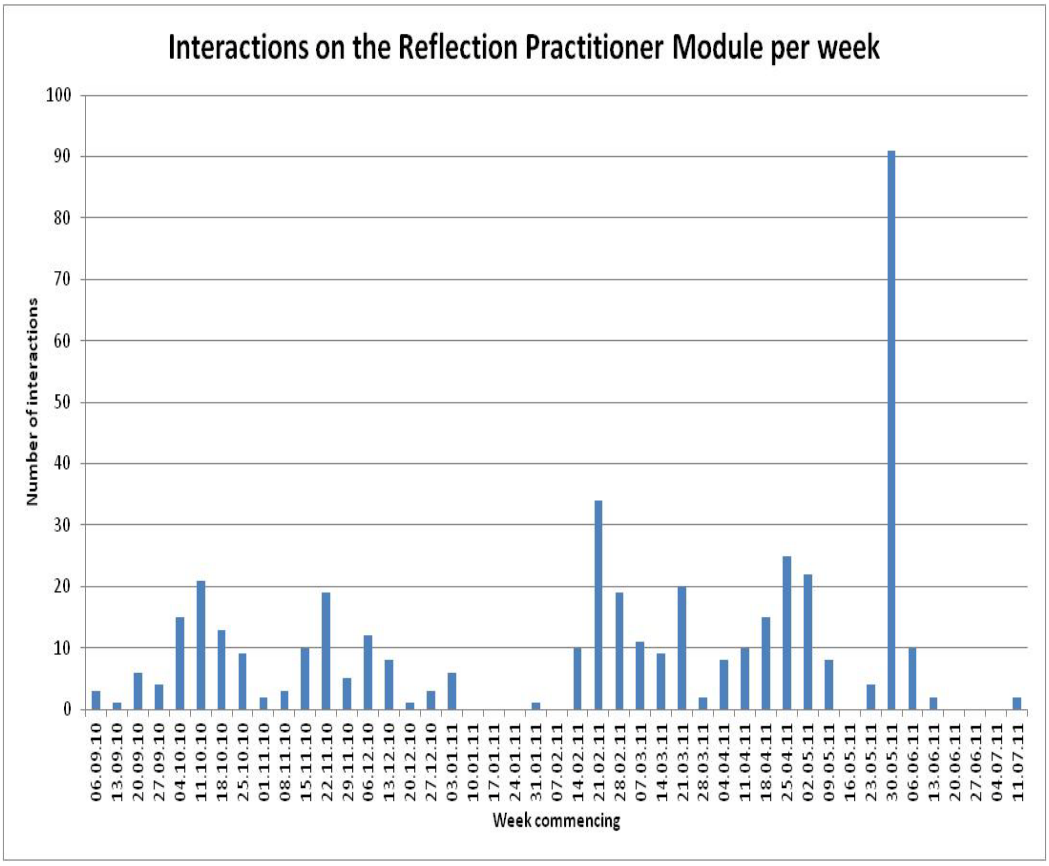


Figure 14. Interactions on the Reflective Practitioner Module per week – 'Themes and Issues' for sample group

5.6.6 Feedback – by course tutors and subject specialists

Feedback on 'Tasks' was given by the course tutors and two specialist tutors. From a total of 122 feedback comments on 'Tasks' 27.9 per cent were made by the English tutor, 1.6 per cent by the mathematics tutor and 70.5 per cent by the course tutors (Appendix 19). Two of the mathematics 'Tasks' did not receive any feedback and six of the students did not receive feedback from subject specialists. The pre-course reflections received more feedback points than any of the other work carried out during the course suggesting this was perceived as an important point in time for tutors to give feedback,. Alternatively, it could have been that this was when the tutors had some time.

If subject specialists assessed all the students' work in their subject, this would equate to 864 'Tasks' to be assessed in English (108 students x 8 'Tasks') and 648 for mathematics (108 students x 6 'Tasks'). Whereas if the course tutors gave feedback for their own group of students (approximately twenty) for the other 'Tasks' this would equate to approximately 240. In addition, tutors were giving feedback at four points during the year for their group of students who were working on nine 'Themes and Issues'. This might have been an unrealistic undertaking for the tutors, and unachievable taking into consideration their other teaching commitments. Analysis of data reveals that 37.7 per cent of feedback on 'Tasks' was directed at three students and that 32.8 per cent of all feedback was given to 'Tasks' in June, towards the end of the course.

5.6.7 Feedback – 'Themes and Issues'

The feedback on the 'Themes and Issues' was given to students by the tutors working on this module, six tutors in total. Course documents stated that work on the 'Themes and Issues' would be reviewed four times during the course as follows:

> 'Your journal will be reviewed by your personal tutor at 4 points across the year. You will be asked to identify the five themes which you have approached at Masters Level. However, other areas will also be randomly sampled. You will receive feedback on both.'
>
> (Primary PGCE Professional Development Profile – Reflective Practitioner Handbook 2010/11:11)

The design of the e-portfolio allowed feedback from tutors. Students were not able, through the e-portfolio, to give feedback to their peers or to share work. Therefore in order to achieve Learning Objective 1, from the module guide, tutor feedback as the more informed other would appear to be pivotal in the scaffolding of the learning that was taking place. Learning outcome 1 states:

> '...use critical feedback, from others and self, to engage in articulate discussion about your practice, philosophical and pedagogical issues to enable you to make judgments and clearly articulate about the effectiveness of your personal learning.'
>
> (Primary PGCE Professional Development Profile – Reflective Practitioner Handbook 2010/11: 6)

Although the majority of feedback comments appeared to be formative in the information they contained, for instance how to improve or questions to encourage deeper thought, the majority were given at the end of the course and not necessarily seen by the individual student. Analysis reveals that only six feedback comments made in June received a response from the student. This represents a response rate to June feedback of 14.6 per cent.

Tutor feedback on 'Themes and Issues' elements of the e-portfolio ranged from one feedback point to twelve (see Appendix 20).

Two students (two and three) received feedback through the e-portfolio for all elements at Masters Level. This might be because the students had complied with the request and renamed the elements on the e-portfolio to sign-post the tutors as requested by the Module Leader in the announcement of 24th November, as previously discussed.

However the dates of feedback suggested that not all students received two feedback points in the three weeks after the announcement. Between 24th November and 22nd December, the four week period after the date of the announcement which stated feedback would be given over the three weeks the following students received feedback:-

- Student three – 21.12.10 two feedback points one for Masters work, one for Professional Level
- Student eleven – 03.12.10 two feedback points, both Masters Level work.

This would suggest that not all feedback was given through the e-portfolio. This was confirmed during student and tutor interviews, highlighting the adoption of different pedagogical approaches by the tutors. This was further confirmed by student seven who uploaded the feedback him/herself. Students three and eleven did not share the same tutor and student eleven was the only one from his/her particular tutor group. However, students three and ten did belong to the same tutor group and student ten's e-portfolio shows that the student did interact with two elements of the e-portfolio before the feedback date of 21st December, 2010 on 'Themes and Issues' of 'Classroom Management and Organisation' as well as 'Learning and Teaching Maths' but had not received feedback. This might have been a result of the student not renaming these elements as Masters work, as requested.

5.6.8 Feedback - pedagogy

The feedback was given at the following points in the course, indicating a formative assessment point in January, March for the final review and edit by students for the summative assessment in June (Table 33).

To understand whether or not there is a relationship between the tutor and the dates feedback was given feedback has been reordered by tutor, see Appendix 21.

Table 33. Frequency of occurrences of tutor feedback on 'Themes and Issues' each month

Month	Number of interactions	% of total (70)
September	1	1.4
October	0	0
November	0	0
December	5	7.1
January	13	18.5
February	1	1.4
March	21	30.0
April	1	1.4
May	8	11.4
June	20	28.5
Total	70	100

From this it could be seen that the individual tutors gave feedback in the following months:-

Tutor 1 - December, January, March

Tutor 2 - January, March, April

Tutor 3 – September, February, March, June

Tutor 4 – December, March, May, June

Tutor 5 – January, May, June

Tutor 6 – January, June

Tutor 7 – June (covering for tutor absence)

The tutors appeared to have adopted different pedagogical approaches to giving feedback. The frequency of feedback and method were not consistent across the tutors. Total number of feedback interactions from tutors on 'Tasks' ranged from one to fifteen and for 'Themes and Issues' from one to twelve, with one student uploading the feedback for the tutor, and one student receiving no feedback through the e-portfolio. Subject Specialist feedback for 'Tasks' ranged from zero to seven with six students in the sample group

receiving no feedback from the Subject Specialists. In one instance the tutor, in the feedback comment to the student, asks for the student to email the response. As noted above, interviews confirmed that students received feedback by email and through the e-portfolio with one tutor group reporting that all feedback was through email.

5.7 Discussion of findings

The data collected throughout the main study revealed that students' experience of using the e-portfolios was, in general, a positive one. These findings contrast sharply with those of the pilot study with regards to satisfaction.

Initial student questionnaires

Data from the questionnaires revealed main study students reported higher confidence in using technology. This appeared to contradict the reported preference for keeping paper copies of documents, but as explained by the students this was a result of their lack of confidence in relying on digital storage. Few students in the main study had been required to use reflective journals on previous work and this might be a factor in the lack of depth of reflection in their work, as reported by the tutors. The purpose for using the e-portfolio appeared to be unclear. Over eighty-four per cent responded that they did know why the e-portfolio was being used on the course, but gave different reasons for the use such as storage space, so tutors could check on the work, and a number of students suggested they were a way to show that you are a reflective practitioner. However, they did question whether or not this was the best way to achieve this final purpose.

Second student questionnaires

The students were split with regards to understanding the theory underpinning the use of the e-portfolio. They also reported varying amounts of feedback received, although acknowledged this may have been their fault for not making sure it was in place at the

correct time. With regards to tutor pedagogy they appeared, by this time in the course, to be adopting different pedagogical approaches to giving feedback. This was in contrast to the pilot phase where all the feedback was given through the e-portfolio. This would suggest that through the experience of using PebblePad they had adopted different pedagogical practices, in order to resolve issues that appeared to influence their capability to give feedback through the e-portfolio. For instance, asking students to email work and then giving feedback on that work puts the responsibility on the students to actually forward the work when it is ready for feedback, this saves time in logging on to the e-portfolio, navigating to work and then giving feedback. This may have been a direct result of the fact that there was no flagging system in place to alert tutors of new work uploaded. By this stage in the course (five months into the course), the students were beginning to see the flaws in the design of the system and asking if this was the best system to use, pointing out the idiosyncrasies built into the design of the e-portfolio.

Interviews and analysis of interactions

The major findings from interviews and interactions with the e-portfolios revealed that for students and tutors this was a positive experience although negative comments were made following use. One of the main reasons for this was the tutors' expertise in using the e-portfolio. In addition, the e-portfolio was part of the University VLE and students were experienced in the use of the tool. However, the design of the e-portfolio was criticised following experience of using it. Therefore, students felt the e-portfolio was an integral part of the tools supporting the course. Other findings from the data analysis include:-

Purpose

The students viewed their e-portfolios as a repository, a place to store their work to be assessed by the tutors. The purpose of the introduction of the e-portfolio was perceived

as a means of giving tutors ease of access to their work and a place for feedback. This was in conflict with the purpose as shown in the course documentation (Appendix 22) revealing a difference in understanding. Authors such as Cotterill *et al* (2004b), Roberts *et al* (2005) and Tosh *et al* (2005) state that it is important to have a shared understanding, but these data seem to indicate that an appreciation of the value of use is more important than shared purpose, unless, of course, the purpose is related to value of use.

'Tasks' and 'Themes and Issues'

Students felt confident in the work completed on the 'Tasks', this may have been because they had clear instructions and guidance on what to do for these 'Tasks'. The 'Tasks' were completed at a specific time with the majority of interactions on these 'Tasks' taking place whilst the students were on placement. This indicated that the students completed activities set by tutors as directed, inferring that when they are given clear guidelines on what to do and when to do it they conform to course guidelines. This suggests adoption of a tutor-centred approach for this element of the course. In contrast, 'Themes and Issues' were not completed according to the module handbook, with students interacting on this element of the course whilst on campus and during the holidays. The tutors acknowledged that the work on 'Themes and Issues' was not a priority for the students and this was why they did not work on this area of the e-portfolio whilst on placement.

There appeared to be two different views of the learning process reflected in 'Tasks' and 'Themes and Issues' without a clear understanding of how the students should use e-portfolios effectively. The work was completed outside school placement therefore the student would not have had the opportunity to discuss the reflection with the experienced teachers in school, this might have been one reason why the tutors commented on

students not seeing the connection between the different elements of the work. Alternatively students seeing the two elements of 'Tasks' and 'Themes and Issues' as completely separate due to the assessment built into the course. With 'Tasks' students received a pass or fail, and with 'Themes and Issues' they were judged on academic assessment criteria whilst receiving feedback on the level of reflection taking place.

Reflection

The tutors agreed that the level of reflection was not at the depth they required and attributed this to the way in which the students approached the work. This was explained as the students attempting to write reflections as an essay, with the assumption that this was the way they had completed assessed work in the past. This might have indicated that the expected style of completing of the reflective writing was not explicit leaving the students to revert to previous behaviour in order to complete work. As the feedback given did not refer to the taxonomy included in the course handbook, it would have been difficult for the students to judge what they needed to do in order to achieve the next level of reflection. Or as suggested by Gomaz (2000) students tend to write descriptively about school practice. Some students commented that they could see how the e-portfolio made you aware of the need to be reflective, but were unable to articulate how this was the case other than as a prompt that it needed to be achieved.

Workload

The workload on the e-portfolio was considered too much by both students and tutors. The students felt overwhelmed by the expectations of the course. This may have been a factor with regards the discrepancy of feedback received by students given the amount of time it must have taken the tutors to provide the feedback. This was an issue that was raised by tutors in the final interview where it was considered that the course design would have to change to rectify the workload for both students and tutors.

Feedback

Feedback was a positive element of the course and during interview the students were able to analyse why this should be so. They felt that the tutors making comments throughout the work in a different coloured pen helped them to improve the work. This could be seen as the tutor editing the work for improvement rather than offering comments to encourage depth of reflection. For some this felt like a close personal relationship, and through this the students felt that their learning was being supported by the more informed other. However, for those students who did not get feedback in this way there was a feeling of the level of support directly associated with the tutor.

Formative feedback was given to encourage the students to reflect on their learning experiences. The feedback was an invitation to reflect on the activities. However this appeared to create a cycle of writing and editing with a sense that there was no end point for the work. For the tutors and students there needs to be closure, a point when work is summatively assessed. However, most students reported positively with the scaffolding they received as learning from the more informed other although this was not necessarily due to the use of the e-portfolio.

There was a discrepancy with the frequency and mode of feedback for the students, both students and tutors confirmed that this was the case. This resulted in the e-portfolio as a pedagogical tool being used in different ways with no common approach for all students. The result of this was dissatisfaction from some students. In addition the amount of feedback given to each student varied enormously. This may have been due to the student missing the deadline or not following instructions to rename sections of the work, but not in all cases.

5.8 Summary and personal reflection

The research questions to be addressed from this data collection included those related to factors influencing the implementation of e-portfolios, how they are used and the relationship between use of e-portfolios and development of reflective learners.

a) What are the key factors influencing the implementation of e-portfolios?

The key factors reported by students were the need for a clear design in two aspects. Firstly the actual design of the elements as they appeared on the e-portfolio and secondly realistic course expectations taking into consideration the amount of time it took to complete the work. In addition, tutor skills were perceived as good in using the e-portfolio and supporting the students. This appeared to be the pivotal factor in enabling students to have confidence in the e-portfolio agreeing with Young (2008) that skills of tutors are important, but going further than this in that skills are more than a contributing factor to the successful implementation. As Krasna *et al* (2007) stated with good ICT skills then positive results are more likely, and Den Doolvan and Kirschner (2004) who say that it this essential if technology is to be a normalised part of work. The purpose of the adoption of the e-portfolio was at variance to that of the University. This may be due to the requirements of the course or the design of the e-portfolio being restrictive in the tools available.

b) How are e-portfolios used by trainee teachers?

The data showed that the students interacted with the e-portfolio at different times according to the work that needed completion. In addition, they did not follow the course guidelines for 'Themes and Issues'. The use varied from student to student, each adopting a slightly different approach to completing the work. This, in some instances, was a result of feedback, preferred way of working, motivation to complete the work and

seeing the purpose for the adoption of the e-portfolio as a means of tutors accessing work and for the assessment process. The e-portfolio was not used as a journal or diary, the design of the e-portfolio did not allow for this. The students completed reflections outside of the school placement weeks, therefore, their learning was not supported by the classroom practitioners as the 'more informed other', an opportunity missed. As with the pilot, students reported that they would not use the e-portfolio again after the course. Tutors may consider how social networking can be utilised to answer student questions in an open forum where they can be viewed by the cohort and how to take advantage of the use of mobile devices which the students use to access course information..

c) Is there a relationship between the use of e-portfolios and the development of reflective learners?

From the tutors' comments regarding depth of reflection it would appear that the e-portfolio does not support all students in achieving the depth of reflection. The possible reasons for this are investigated in chapter 6.

Reflection

My position in the research may have been viewed by the students as a person in a position of power, although students were reminded throughout the interview process that I was not teaching at the University and, therefore, not responsible for any assessment that took place. However, on looking back my decision to carry out the interviews on the University campus may have been interpreted as an indication of my power within the University as I was able to book rooms, and as such holding an equal level of power as tutors. On reflection it may have been a wiser decision to hold these interviews elsewhere on neutral ground, or in a place of the students' choice. Also the decision of conducting tutor interviews in their office may have influenced the responses to questions as tutors were in the comfort of their own surroundings, may have felt superior and in

control of the interview, therefore, the relationship between tutor and interviewer may have been different to that of student and interviewer.

This part of the research was more positive than the pilot. This once gain challenged my beliefs and led me to consider the reasons for the findings at this course level, but also the implications that this has for the wider ITE community. Looking back on the process of data collection, the responses from the participants in the main study followed more closely the expectations I had at the beginning of the research process. This conclusion was based on my own personal position and identity as a manager of an ITT provision and someone who has been responsible for the introduction of an e-portfolio, this could be described as my *habitus* (Bourdieu 1989). Therefore, it was important throughout the data collection and analysis that I was aware of my position to reduce any influence it may bring to bear on the responses from the participants. However, this part of the research enabled me to question what my analysis revealed, challenging my personal beliefs leading to self awareness particularly in understanding the context for interactions, frequency of interactions and how feedback was given. This is described by Archer (2003) as fractured reflection, a time when I was perplexed and confused as the findings were not expected and led me to analysing the story the data revealed and also the background story informed by the voice of the tutors and students.

Implications for ITE

The implications for ITE are both pragmatic and conceptual, which are briefly outlined below, and will be discussed in full in chapter 7. In terms of the outcome of this part of the research the issues are concerned with student voice to maintain the integrity of the model of learning with regards to the activities and context, assessment issues, professionalism and the dilemma of what constitutes reflective thinking and practice. In addition student voice and the implication for the ITT inspection regime and how the e-

portfolio supports the tutor in understanding how students use the technology are discussed.

The designers of ITE courses need to consider the opportunities that students have to complete the work. If, as in this case, students do not have the time to complete work whilst on placement due to the overwhelming nature of the task of teaching, then this should be acknowledged in how activities are planned and assessed. This will enable students to comply with course expectations and also support the link between the different aspects of the course. In this research the students appeared to be using the e-portfolio for uploading as a test, not as a record of their development through the documentation of their journey on a reflective journal, as anticipated in course design. This appeared to be because the work was assessed. If, as a result of formative feedback, students are encouraged to edit their work to produce the 'best copy', then the opportunity to see change over time is lost. In addition, feedback that asks for more work creates an environment where work is never complete, creating more and more work for both the tutor and the student. In this research the mentor, the experienced classroom practitioner, did not have a role in development of trainee teacher reflections. This may have provided an opportunity for closer links between theory and practice particularly as the students in this research did not, according to tutors, achieve the depth of reflection anticipated. Students seeing the connection between theory and practice may also have been compromised through the use of paper-based files and digital files for different parts of the course. They may see these elements as connected to the context in which they are used rather than as an holistic record of their training experience, therefore paper file for school experience and digital for University work. Therefore, further research into the way in which students reflect using e-portfolios as a pedagogical tool would enable a greater understanding of the process of reflection. This includes investigation into the way in which work is assessed, and by whom, and achieving an understanding how

students are motivated to use the e-portfolio. In addition, the role of the experienced classroom practitioner in the formation of student reflection and the assessment process may need further investigation as this has a bearing on e-portfolio design. A starting point for ITE may be a clear understanding of what constitutes reflective thinking and practice and how competencies and reflective thinking can both be accommodated with integrity within course design.

In a climate where students are paying tuition fees then issues such as value for money with regards course content, ensuring that tutor support is well informed and ensuring all support for students as advertised is realised in their experience needs to be considered in delivery of the training. For instance, as mentioned in this chapter there were inequalities in the feedback given to students and this does have implications when considering how students will judge the quality of the training provided. This is particularly important within the current Ofsted inspection regime where Providers are being judged on the quality of training they provide by seeking the views of all stakeholders, including current and past students. Therefore student satisfaction on the quality of training is important and student voice cannot be ignored. Student voice is also essential for the integrity of the model of learning. If ITE course designers are using a model of learning for students to understand learning in the classroom then tutors must adopt that model of learning. This involves the tutor modelling the approach of the more informed other who listens.

Ownership did not appear to be an issue in this research, however, it is cited in the literature as being extremely important that students have ownership over their e-portfolios including how and to whom they share the contents. Further research would identify whether or not this is an important aspect and the outcome may influence future e-portfolio design.

In the pilot phase the course tutors would not have been able to carry out the level of analysis that this research undertook in the main study. This is because PebblePad did not support a way of collecting this information. Therefore in order for the tutors to support students and, therefore, maintain a consistent model of learning through the course, they need to understand how the students use the e-portfolio. This understanding refers to frequency of interactions, context for these interactions and how the student responses to feedback. By having a clear understanding of student use the tutors will be in a better position to support the development of students by targeting feedback when it is required, rather than giving feedback when dictated by course design.

The following chapter looks in-depth at student reflection and concludes with implications associated with reflective thinking for ITE.

Chapter six: Main study – Part 2: Students' reflection in the e-portfolios

6.1 Introduction

The material analysed in this chapter relates specifically to text uploaded on the e-portfolios as it related to the Masters element of the PGCE course, that is students' responses to the assignments labelled 'Themes and Issues'. As noted in chapter 1, nine 'Themes and Issues' were listed in the module handbook - Assessment for Learning, Classroom Management, Differentiation and Personalisation, Learning and Teaching English, Inclusion, Curriculum Design, Collaboration, Learning and Teaching Maths, and What is Learning. Students were required to select five of these and reflect on their understanding of these in relation to research literature, school experience and discussion with peers at the university. Guidance given to the students on how to complete these assessments were included in the module guide, as noted previously (Appendix 15). To explore the research questions 'How are e-portfolios used by trainee teachers?' and 'Is there a relationship between the use of e-portfolios and the development of reflective learners?' this material was scrutinised and analysed in two ways. A manual thematic content analysis was carried out on the text uploaded on the e-portfolio by the sample of seventeen students who agreed for their e-portfolios to be analysed. In addition the work was analysed against the Hatton and Smith (1995) reflective framework to understand the depth of reflection that occurred in the students' writing.

Content analysis was applied to the text and a grounded approach was then adopted to identify appropriate categories from this material. Five categories emerged: 'Personal

Philosophy', 'School Practice', 'What the Literature Says', 'Development of Thinking' and 'Reflection on Reading'. The content analysis enabled identification of the category and frequency of reflection but did not identify the depth of reflection itself. As the literature review had indicated, reflection is a fundamental attribute for trainee teachers but how it is to be defined and achieved is less clear. It was therefore very important to use an appropriate tool that enabled identification of the depth of reflection in students' work on the e-portfolios, so that change and development in students' reflective thinking across time, was possible.

Differing attempts have been made to define the concept of reflection, and identify the components of this complex activity. For the purposes of this research the following definition which was used on the course has been adopted. This author directly addressed trainee teachers as follows:-

> 'I would like you to think of reflection as involving a thoughtful examination of your own practice, based on your analysis of the successful practice of others, and research findings, including your own research in your own classrooms.'
>
> (Sewell 2008:40)

This definition aligns with the course documentation and the tutors' and students' understanding of the description of reflection that was desirable for completion of reflective writing.

For the purpose of rigour, the choice of framework to identify depth of reflection was crucial. As commented already, a decision was taken not to use the taxonomy of reflection from course documentation. Its overly complex nature meant that its application to the material uploaded to the e-portfolios was highly problematic. The Hatton and Smith (1995) framework of reflection was, therefore, adopted for the following reasons. It has a very firm foundation routed in theories of reflective thinking (see Literature Review chapter 2). It had been developed from research into the strategies

that support the development of reflective writing with trainee teachers and from this an hierarchy of evidence of reflective thinking had been designed. In addition the Hatton and Smith framework had been tried and tested elsewhere and found fit for purpose in identifying depth of reflective thinking in students' writing. Further the taxonomy from the PGCE course was mapped against this framework and when analysed in detail was clearly compatible with it (Appendix 24). Also the taxonomy in the course documentation was not referred to by students or tutors in feedback, so appeared to be redundant. The taxonomy is discussed further in section 6.4.

In hindsight, this aspect of the research proved to be the most challenging for me owing to the amount of work to be achieved within the timescale and the method of analysis. This was due to the amount of work the students had uploaded over the duration of the course and the different approaches they had adopted for completion of the assessed work. In addition, I had no previous experience of analysing reflection for the purpose of occurrences of reflection and depth of reflection, therefore, the process was both time-consuming and I felt uneasy and unsure when constructing and deconstructing the research story. However, I knew this was an important element of the research in understanding how the students developed their reflective thinking, and how this was supported by the tutor. If I had not undertaken this work then the research would be incomplete as it would not discuss the process and assessment of student reflection. The process of analysis emphasised the importance of understanding my position in the research and led to a deep examination of my own beliefs regarding the assessment of reflection. This complex process is explained by Fook (2002) as problematic when trying to understand one's self, and the positioning of the researcher in the research.

6.2 Identification of categories

In this section the five categories are explained with a discussion of the main findings in each category. A total of 3,217 occurrences of reflection were identified and the individual context for each occurrence was coded. These individual context codes were then organised into five thematic categories resulting in 31.0 per cent of data categorised within 'Reflection on Reading', 21.8 per cent 'Personal Philosophy', 18.6 per cent 'Development of Thinking', 15.2 per cent 'What Literature Says' and 13.3 per cent for 'School Practice' (see Figure 15). This would indicate that 'Reflecting on Reading', where the students are constructing their knowledge base making them more informed, was the most important occurrence for reflection.

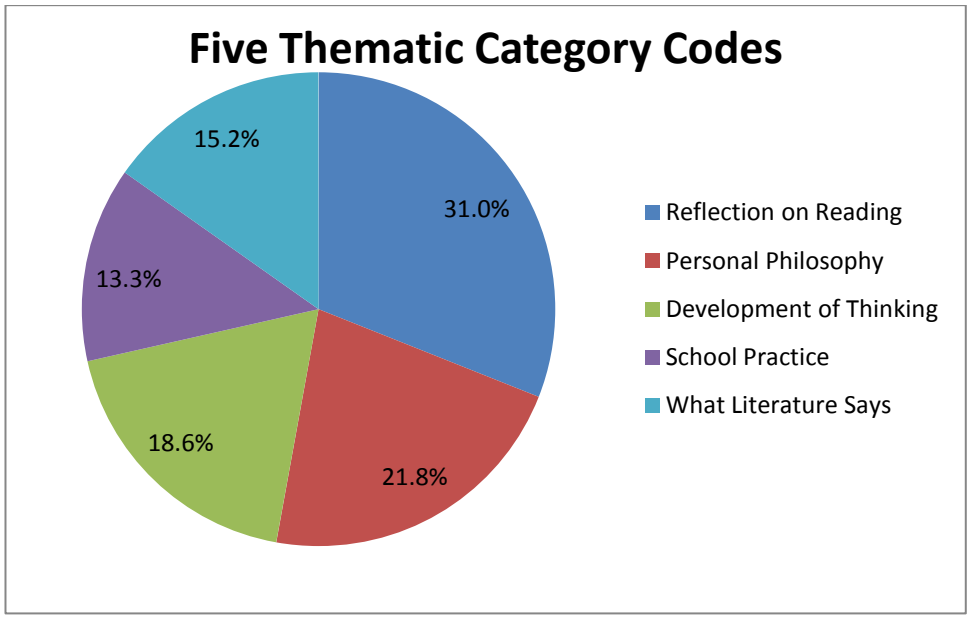


Figure 15. Five thematic category codes identified in students' e-portfolios

'Personal Philosophy'

In this category the student was making a stance, 'This is what I believe in', resulting from a mulling over of ideas, exposing gaps in knowledge and making propositions for the future based on his/her personal belief (Table 34). Text coded in this category referred

to the student stating what he/she believed in (a conceptual response to the questions posed within the module guidance), and what he/she understood and what he/she proposed can be done. It is, in part, the ideology of the student and provides the starting point for reflecting on prior experience which may or may not change over the time work was being completed. Over fifty-seven per cent of the reflective occurrences in this category were from the student's own opinion on how an outcome can be achieved, together with ensuring it does. In this the student is saying in effect,' this is my personal belief on the educational issue being discussed, based on prior experience not linked to literature or placement experience. For example, when discussing:

> "It is possible to include all pupils by differentiating the work"

the student expressed an opinion on how this can happen without directly referring to the literature or placement experience.

Table 34. Frequency of occurrences of codes for category 'Personal Philosophy' identified in students' e-portfolio

'Personal Philosophy'	Freq	**%**
Own learning style	16	2.3
Own misconception of issue	7	1.0
Realisation what it means/reference to lack of understanding	45	6.4
What good teachers do	25	3.6
What excellent teachers do	15	2.1
Own opinion on how it can happen	216	30.7
How to implement in school	95	13.5
Importance of meeting needs of all	98	13.9
How to ensure it happens, what needs to do done (generalisation)	186	26.5
'Personal Philosophy' TOTAL	703	100.0

Another student expresses a similar opinion in greater detail on how to ensure that his/her own perception of good practice is achieved:

> "It is important that children who are classified as gifted and talented are sufficiently challenged so that they are developing to meet their own personal potential, I believe by differentiating the work this can be achieved".

'School Practice'

This category included reflection in action (Schön 1987), this being a record of reflection drawn from teaching experience when something did not happen as expected, or an occurrence or event that is in conflict with 'Personal Philosophy', sufficiently to elicit comment. Also included in this category was 'knowing-in-action', the descriptive account of dealing with the expected. The student was saying 'this is what I did' as a critique of experiences, reference to own teaching, collaboration with others, school policy and impact on school (Table 35). Within this the student was discussing 'School Practice' without any reference to literature, merely reflecting on their experiences in school and comparing it to their 'Personal Philosophy'.

Table 35. Frequency of occurrences of codes for category 'School Practice' identified in students' e-portfolio

'School Practice'	Freq	**%**
Critique of current placement	31	7.2
Reference to own teaching experience this is what I did	186	43.5
Asking other professionals/seeking help from others	15	3.5
Description of what school does (policy)	162	37.9
Comment re impact on school of doing this	34	7.9
'School Practice' TOTAL	428	100.0

As would be expected the highest frequency of reflective occurrences, 43.45 per cent was with reference to their own descriptive reflection on teaching experience, 'This is what I did' and 37.85 per cent school policy, 'What the school does'. This places the reflections within the domain of personal experience and how this fits in with the wider community adoption of a policy. The fewest references recorded in the reflective occurrences were in 'asking others for help'. As students are working in an 'apprenticeship' model of training, one might have expected more references to requests for support. This may indicate a cultural bias, whereby, when writing for assessment

purposes, the students not wishing to disclose asking for help as this may be seen as a weakness. This may be a strategy adopted when completing writing and writing to the assessment brief (Pecheone *et al* 2005). Alternatively the students may have felt that as the writing was an expression of their own reflections, they write only about themselves in the role of teacher. As the course is an assessment of them as suitable candidates for the recommendation of QTS then they may not have felt it appropriate to comment on seeking help as this may have been perceived as a failing. It may well be the student's interpretation of the purpose of writing that influenced the way in which they perceived the writing would be assessed, resulting in 'writing to the test'. Alternatively as explored in Chapter 5, as interactions did not take place during school placement weeks, there was not an opportunity to ask experienced teachers.

'What the Literature Says'

Within this category the student was saying 'This is what I have read', and used this knowledge to define the understanding of the issues: the literature is cited as a review of good practice and not embedded within the discussion of experience and a critique of literature (Table 36). This is where students gave a short literature review within their work.

Table 36. Frequency of occurrences of codes for category 'What Literature Says' identified in students' e-portfolio

'What Literature Says'	Freq	%
Defines Terms - this is what it means	80	16.4
Literature what is says you should do	388	79.5
Criticism of literature	20	4.1
What Literature Says TOTAL	488	100.0

It is apparent from the reflective occurrences in this category that the majority of references (79.5 per cent) were from what the literature says 'You should do' to address

the educational issue being discussed, shown by the student including a short literature review without any reference to experience. For example,:

> "According to Ryan and Griffin (2010) since the Education Acts 1988 and 1992, parents have become increasingly viewed as partners in their child's education and have become key stakeholders in the educational process..... schools should acknowledge this in home school agreements."
>
> (Ryan & Griffin 2010:442)

The criticism of the literature appeared to come from the student's personal philosophy on the educational issue.

'Development of Thinking'

The students' construction of knowledge and understanding was revealed through this category. This may be reflection prior to action, hypothesising or reflection-on-action (Schön 1987) in the form of jottings, where the student had used the e-portfolio as a notebook. For instance, the linking of ideas from posing questions to be answered, reference to what has been said in lectures, the literature search resulting in the addition of quotations, hyper-linking to other documents/websites, the use of structuring devices as a means of organising thoughts through sub-headings and the formation of a draft introduction to signpost the reader to the issues to be covered. This could be described as a cycle of externalised reflection taking place as a consequence of reflection in the other categories, the other categories being the experiential cycle and the development of thinking as a fluid record of their emerging knowledge feeding from and to the other categories. Externalised reflection is an iterative process, repeated with hindsight because it may have happened before as an internal process (Table 37). The writing down becomes the externalisation of inner thoughts, which may be a second reflective cycle. The activity of writing the reflection down was reflection in another genre, an expression of meta-cognition, 'thinking about thinking' which in turn refined the reflection further as

it could act as a stimulus to one's own thinking. Bolton agrees by commenting that reflective writing is, 'self-illuminating and exploratory process' (2012:8).

Table 37. Frequency of occurrences of codes for category 'Development of Thinking' identified in students' e-portfolio

'Development of Thinking'	Freq	%
Viewed only	63	10.5
Adds questions	60	10.0
Refers to lectures	26	4.3
Adds quotes	243	40.6
Adds hyperlink	65	10.9
Adds sub headings	24	4.0
Introduction	118	19.7
Developing Thinking TOTAL	599	100.00

The most frequent activity in 'Development of Thinking' was to add quotations from their reading of the literature (40.6 per cent), by adding the full reference then a direct quote with notes, or in most instances, notes explaining the view point. An example comes from the theme 'Classroom Management' where a student added the reference and then wrote:

> "Confounded by official document overemphasis on control links to Bill Rogers work – you can't control a child, they choose whether or not they do something".

From this starting point the student moved from making notes to writing arguments in full.

The least coded category is reference to lectures, despite that fact that students reported work on this element of the course was considered as a campus activity. The interview data suggested students saw the assessed element of the course as a campus-based activity rather than an integral part of their training, so one would expect reference to taught sessions to feature highly. The lack of reference to lectures implied that students may not be making a direct link with lectures informing assessed writing, or perhaps an avoidance of stating the obvious. Alternatively they may have considered that as this is an assessed

piece of work, and that writing independently revealed their ability to work autonomously.

'Reflection on Reading'

In this category the students attempted to make sense of their abstract or concrete experiences by referring to literature. This section was different from 'What the Literature Says' because the student was attempting to place their writing within the context of their experience in school placements, whereas in 'What the Literature Says' the student was compiling a literature review (Table 38). This section goes further than describing isolated experience by beginning to make sense of the issues with reference to different occurrences.

Table 38. Frequency of occurrences of codes for category 'Reflection on Reading' identified in students' e-portfolios

'Reflection on Reading'	Freq	%
Literature no link	332	33.2
Reflecting on literature	18	1.8
Literature and theory discussed	92	9.2
Literature linked to practice description	382	38.2
Reference to Standards	33	3.3
Lit/practise/what will do as result	142	14.2
'Reflection on Reading' TOTAL	999	100.0

One third of the reflective occurrences (33.2 per cent) came from a description of literature placed in the context of actual practice but not linked to a specific learning episode. Slightly more (38.2 per cent) showed the student linking the literature with an experience which may be an observation of another practitioner or own experience. Through tutor feedback students were encouraged to link literature with examples of personal experience and this may account for the high percentage of reflective occurrences in this area. What was interesting was the way in which some students were

able to reflect in a wider context by making reference to multiple perspectives from the school community as well as policy, and considering issues outside of the immediate context (14.2 per cent), this action revealed a greater depth of reflection than the reflective occurrences in other areas. Few comments (3.3 per cent) take into account the competency Standards which were required in order to achieve QTS, indicating that students may not have been reflecting in the wider context of policy. Alternatively, as the evidence against the Standards was kept as a paper file, students did not see the connection. Therefore, students did not necessarily make the link between this work on the e-portfolio and the Standards.

Cross comparison of reflection within categories and 'Themes and Issues'

The discussion above has focused on the categories in which reflection took place. It was also important, however, to investigate whether the category in which reflection took place was associated with the choice of 'Theme and Issue' made by the student. The mean scores derived from the frequency of incidents of reflective thinking in each category ('Personal Philosophy', 'School Practice', 'What Literature Says', 'Development of Thinking' and 'Reflection on Reading') and number of students completing each theme/issue (Assessment for Learning -seven students, Classroom Management - sevens students, Differentiation and Personalisation - ten students, Learning and Teaching English - three students, Inclusion - eleven students, Curriculum Design - seven students, Collaboration - eight students, Learning and Teaching Maths - eight students, What is Learning - twelve students) was investigated. This analysis indicated that the students approached the 'Themes and Issues' differently, scoring high mean values in the category 'Reflection on Reading' for five 'Themes and Issues', and revealing how 'Personal Philosophy' plays a significant part in constructing the 'Themes and Issues' on classroom management.

The analysis shows that 'Themes and Issues' that are also curriculum subjects, English and Mathematics, attracted the highest mean frequency of occurrences of reflective thinking in the category of 'Development of Thinking' (Table 39). This may result from the fact that as trainee teachers they would be teaching these subjects every day of the week for approximately one hour and the students would be expected to have sufficient subject knowledge to meet the QTS standards in these areas. Thus English and Mathematics are likely to be a primary focus for their attention. Interestingly the Theme/Issue Learning and Teaching Mathematics had the lowest mean frequency of occurrences of reflective thinking for 'Personal Philosophy', 'School Practice' and 'What Literature Says'. This indicates that the students are not drawing on their own philosophy, what was happening in schools or reporting on the literature for this theme.

Table 39. Frequency of occurrences indicating reflective thinking by category within 'Themes and Issues'

'Themes and Issues'	No Students	'Personal Philosophy'	Mean	'School Practice'	Mean	'What Literature Says'	Mean	'Development of Thinking'	Mean	'Reflection on Reading'	Mean	Total occurrences
Assessment for Learning	7	102	14.5	57	8.1	95	13.6	41	5.9	134	19.1	429
Classroom Management	11	134	12.2	60	5.4	97	8.8	63	5.7	96	8.7	450
Differentiation and Personalisation	10	108	10.8	45	4.5	126	12.6	56	5.6	116	11.6	451
Learning and Teaching English	3	10	3.3	24	8.0	20	6.7	51	17.0	41	13.7	146
Inclusion	11	114	10.4	86	7.8	54	4.9	45	4.1	189	17.2	488
Curriculum Design	7	56	8.0	34	4.9	16	2.3	63	9.0	68	9.7	237
Collaboration	8	62	7.7	47	5.9	36	4.5	23	2.9	106	13.2	274
Learning and Teaching Maths	8	18	2.2	26	3.2	8	1.0	121	15.1	83	10.4	256
What is Learning	12	99	8.2	49	4.1	36	3.0	136	11.3	166	13.8	486

Assessment for Learning was a Theme/Issue that had the highest mean frequency of occurrences of reflective thinking for 'Personal Philosophy', 'School Practice' and 'Reflection on Reading'. As students, trainee teachers are participants in the assessment process. This may explain the expression of personal views in this area. Assessment of pupil performance and tracking of individual pupil progress was high on the agenda of schools as this is a benchmark used by central government to judge success. Consequently it was an area to which the student would have been exposed during placement. Assessment and personal values associated with this are highly contested areas, however. There may well be a tension between the views, values and beliefs of students in relation to assessment and those tutors who are responsible for assessing the work of these students on the e-portfolio. Tutor assessment of students' work within the theme/issue of assessment may, therefore, seem to students to be invalid where students and tutors differ significantly in their views. It is the degree to which the individual values the mode of assessment as well as their own philosophy behind the different modes of assessment that may be controversial. One has to consider how a fair assessment can be made if the assessor does not share the philosophy and values of the person writing. In summary, the issue here was of valid assessment of reflection when the issue being discussed does not match personal beliefs and when one is writing to toe the political line (Sutton *et al* 2007; Pavlovich *et al* 2009).

When exploring the 'Themes and Issues' the occurrences of reflective thinking in the category 'Reflection on Reading' had the highest mean score for the work carried out by the students in 'Assessment for Learning', 'Inclusion', 'Curriculum Design', 'Collaboration' and 'What is Learning'. This suggested that the students were able to read about the subject, compare this to their classroom practice and reflect on their experience in comparison with the literature. The very high mean for occurrences of reflective thinking relating to 'Personal Philosophy' in the theme/Issue Classroom

Management suggested that students' own philosophy plays a major part in the consideration of behaviour management especially when considering that 'School Practice' has the lowest mean for the theme. Personal beliefs about Classroom Management are more frequent than what is happening in school, inferring that the student finds more to say about their own belief system than what is happening in schools.

The above suggest that the different topics in 'Themes and Issues' lend themselves to students reflecting at different levels and, in particular, that their personal philosophy influenced their reflective thinking in the 'Themes and Issues' differently depending on the topic. For example when considering Classroom Management the sub-category 'personal beliefs' played a major role in their writing. In contrast, a low mean score in Mathematics and English suggests, that for these curriculum areas, students did not drawing on their personal values. This appeared to indicate that, for curriculum subject areas, the students are not relying on their personal philosophy to understand and make sense of what is happening in practice. This may be due to their confidence in bringing their 'own beliefs' to these 'Themes and Issues', or their acceptance of information gained through reading and experience as being more valid than their own perception, or that they do not have the prior experience to draw on in order to express a personal belief.

Frequency of reflective occurrences per month

The total coding for interactions has been explored in Section 5.6. This is further analysed by looking in the current section at the frequency of coding of reflective occurrences per month per category. By displaying the reflective occurrences by month (Table 40) it can be seen that October had the highest number of instances of reflective occurrences within 'Development of Thinking', suggesting that this was a time when the students were thinking about the construction of their reflections, deciding on what to

cover and collecting together evidence to support their argument. This represented the early focus for their work and although reflective occurrences for this category did diminish it was apparent throughout the months and implied that 'Development of Thinking' was an area that was revisited.

Table 40. Frequencies of occurrences of reflective thinking by month and category

	'Development of Thinking'	%	'Personal Philosophy'	%	'School Practice'	%	'What Literature Says'	%	'Reflection on Reading'	%	Total
Sept	19	3.2	3	0.4	2	0.5	2	0.4	5	0.5	31
Oct	196	32.7	25	3.6	5	1.2	8	1.6	39	3.9	273
Nov	84	14.0	40	5.7	22	5.1	33	6.8	69	6.9	248
Dec	49	8.2	20	2.8	15	3.5	43	8.8	77	7.7	204
Jan	5	0.8	13	1.8	10	2.3	10	2.0	11	1.1	49
Feb	63	10.5	90	12.8	61	14.3	53	10.9	142	14.2	409
March	32	5.3	85	12.1	84	19.6	65	13.3	106	10.6	372
April	31	5.2	106	15.1	59	13.8	74	15.2	146	14.6	416
May	62	10.4	160	22.8	76	17.8	99	20.3	181	18.1	578
June	58	9.7	161	22.9	94	22.0	101	20.7	223	22.3	637
July	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Total	599	100	703	100	428	100	488	100	999	100	3,217

October was also a time when the first formative feedback point was planned; this may suggest that the students were uploading in readiness for feedback. For all the other categories the reflective occurrences become more frequent during the period February – June when the students had completed half the course and had the experience on which to reflect, as confirmed during the student interviews. In relation to the increase of reflective occurrences in February it is quite possible that this related to the forthcoming formative feedback point in March. All reflective occurrences in categories, with the exception of 'Development of Thinking', increased in May and June. This was possibly due to the final deadline for all work to be finished or a time when the students were able to finalise

work as their experiences were coming to an end and therefore they had the material to write about. This may suggest increased reflection as the course progressed.

6.3 Analysis of reflective activity

Given the degree of debate around what reflection is and how it is defined, determining level or depth of reflection is problematic. The purpose of assessment of this element of the e-portfolio is formative to support the development of reflective practice and summative to determine the level of attainment achieved at the end of the course. The content coding described in Section 6.1 identified occurrences of reflection but not the level of reflection. The 'Reflection Taxonomy' framework created by a university lecturer, Appendix 8, was included in the module guide placing the reflective activities within each level of reflection. This taxonomy was compiled by bringing together different views from the literature and presented in the module guide as a hierarchy of reflective stage together with the characteristics for this stage. This taxonomy set out the descriptors for hierarchical levels of reflection. The characteristics of the reflective stage gave a detailed account of the type of reflective activity taking place in each reflective stage. The five reflection stages included in this taxonomy were 'Initiate/ Reporting/ Technical', 'Novice/ Responding/ Descriptive', 'Emergent/ Relating/ Dialogic', 'Adaptive/ Reasoning/ Critical', 'Autonomous/ Reconstructing', suggesting that those who achieve 'Autonomous/Reconstructing' are working at Masters Level.

For example level 2 of study gives the reflective stage as 'Emergent/Relating/Dialogic' with the characteristics as follows:

> 'Rationalising and adapting observations in the light of personal or vicarious experiences. Identifies aspects of the information which have personal meaning or which connect with their prior or current experience. Recognises relationships between ideas. Identifies something they are good at, something they need to improve, a mistake they have made, or an area in which they have learnt from their practical experience. Attempts to provide reasons, based on personal judgement or reading of literature. A form of discourse with one's self, an exploration of

> possible reasons. Selection of relevant material to make meaning of learning. Demonstrates resilience through self analysis. Identify own problem solving techniques. Analysis with some guidance.'

(Primary PGCE Professional Development Profile – Reflective Practitioner Handbook 2010/11:15)

Despite the level of detail of each reflective stage there was no indication of whether or not all the characteristics of each one would have to be fulfilled in order to judge that a student had reached any particular level of reflection. Assessment of students' work on 'Themes and Issues' in the e-portfolios was, therefore, very difficult. As can be deduced from the extract given above it was difficult to find examples in the students' work that fulfil every characteristic within 'Emergent/Relating/Dialogic'.

The highest 'Reflective Stage' in the taxonomy provided the most difficult characteristics for the students to meet. The reflective stage of 'Autonomous/Reconstructing' gave the characteristics of this level of reflection as:-

> 'Extensive reading and researching. Independently applying personal knowledge and experience to unknown situations, taking into account cultural, social, political and ethical phenomena. Displays a high level of abstract thinking to generalise and/or apply learning. Draws an original conclusion from their reflections, generalises from their experiences, extracts general principles, formulate personal stance of pedagogy or take a position on an issue. Extracts and internalises the personal significance of their learning and/or plan their own future learning on the basis of their reflections. Involving reasons giving for decisions or events which takes account of the broader historical, social and/or political contexts.'

(Primary PGCE Professional Development Profile – Reflective Practitioner Handbook 2010/11:16)

For each theme the students were given a minimum word count of 1000, with the expectation of them completing each theme within 1500 words, therefore making it difficult to quantify whether extensive reading and researching had taken place as this was not always evident in writing given the word count restriction. The depth of analysis was not always present in students' work with a tendency to skim over issues in order to address each element of the guidance. Analysis of the students' reflective writing revealed that the students were unable to fulfil the characteristics within this level of

reflection to a satisfactory degree, therefore this level of reflective writing as outlined in the 'Taxonomy' was not met.

As explained above, this taxonomy proved to be problematic in applying it to the work on the e-portfolios due to the complexity of each level within the hierarchy of depth of reflection. This resulted in the 'Taxonomy' being unworkable and, hence, not fit for purpose without clarification as to whether all criteria had to be met. This clarification had not been made.

In order to achieve as much rigour as possible, and as discussed in the literature review chapter 2 and methodology chapter 3, the content analysis coding was mapped to the Hatton and Smith (1995) framework of reflection (see Appendix 9) as a proxy for the course taxonomy framework that formed part of the module guide (Appendix 25).

6.3.1 Hatton and Smith framework of reflection

As discussed in the literature review, assessment of reflective thinking is highly problematic. Hatton and Smith (1995), however, acknowledged some of the issues implied here, in seeking to investigate the nature of reflection and strategies to assist reflection. They developed a framework of hierarchical reflection for the purpose of assessing forms of reflection for use in teacher education. In doing so they based their work very firmly on some aspects of Dewey, Schön, and Habermas. Other researchers have subsequently followed Hatton and Smith's work in adopting this framework in their own research on the development of reflective thinking. This is the framework that has also been used in the current study for the purposes of determining the level of reflection that occurred in students' e-portfolios on the PGCE course.

Hatton and Smith used four level descriptors in their framework for reflection 'Descriptive Writing', 'Descriptive Reflection', 'Dialogic Reflection' and 'Critical

Reflection'. The first identifies writing that does not contain reflection. It is the description of an event with no explanation or justification for what happened. It is the writer recalling an event or sequence of events without providing reasons for why it happened. The second descriptor 'Descriptive Reflection' includes an attempt to justify the event or action. It includes reflection from one perspective or the writer recognising that there may be multiple perspectives. Hatton and Smith suggest that the majority of reflection falls within this descriptor. The third descriptor is 'Dialogic Reflection' where the writer can be seen as having a dialogue with him/her self, a mulling over of ideas. There is an exploration of the ideas with an analysis of the event, reason for event or justification of why it happened in the way it happened. This may be from one perspective or from multiple perspectives. The fourth descriptor, 'critical reflection' indicates that the writer is able to recognise that actions or events are influenced by and sit within its social, cultural and political context.

Levels of student reflection were mapped against content coding, the Hatton and Smith framework and the taxonomy in the PGCE handbook. This mapping shows very clearly that whilst identification of levels of reflection can be made against the Hatton and Smith framework, identification against the taxonomy is partial at best. Mapping of students' level of description can be achieved against some of the descriptors in the taxonomy (Appendix 24).

6.3.2 Examples of reflection from students' work

The following sections give examples of work that fell into each descriptor using the Hatton and Smith framework and how the reflective activity was modified in subsequent submissions. For some students there was no modification of submission as they uploaded one document as the first and final submission.

Descriptive Writing

'Descriptive' is defined by Hatton and Smith as:-

> 'Descriptive Writing - Not reflective. Description of events that occurred/report of literature. No attempt to provide reasons/justifications for events.'
>
> (Hatton & Smith 1995:48)

In this extract, the first draft, the student described the theory, reporting from reading. This is a descriptive account of the literature, a reporting of reading. The student was not reflecting but commenting from the literature read:

> Extract One – November: Social Constructivists such as Lev Vygotsky also highlighted the importance of learning as a social context in relation to talk. Vygotsky's (cited in Bartlett and Burton, 2007, pg 127) belief was that talk should be used as a learning tool. One of Vygotsky's main points in his theoretical work was the encouragement of talk, which allowed learners to refine what they know through the articulation of talk.

In December the student received feedback on the above extract guiding the student on how to improve the work. The feedback said 'You need to explain what this 'encouragement of talk' really meant'. The result of this feedback was that the student acted on it by editing extract one, and gave an example from school. By giving the example the student apparently believed that he/she was responding to the feedback, but the feedback was not sufficiently clear to enable the student to understand how to reflect on the example. The student took the word 'explain' to mean 'give an example' from school. During interviews students clearly reported on the advice they had been given by the tutors that they should link literature with school experiences for all work on the Masters module. This is what the student did in this case, took the literature and explained what this looked like in the classroom setting. The feedback given was ambiguous and lack of clarity may have led to the misinterpretation by the student. In the second extract, following feedback the student moved the discussion into the classroom but does not go further than a descriptive account. Therefore, although the feedback was acted upon it had not encouraged the student to reflect and move the account beyond

descriptive writing. Although the inclusion of an example from the classroom indicated that in the period November to April the student had developed his/her thinking to an extent that he/she was able to identify an example, this may not have been from his/her own personal experience, and further reading may have given the student the opportunity to state what may happen in school. This shows that although five months have elapsed from the first entry the student was not developing his/her thinking on this issue as he/she was not able to contribute a great deal from experience or reading to reflect on the topic.

> Extract Two – April: Adds. A common example of this theory viewed in schools is the use of 'talk partners'. Children are paired up with another child by the teacher. These partnering are normally used so children can discuss ideas or problem solve together. Clarke (2008) highlights the use of talk partners having a positive impact on children's cognitive and social development. Vygotsky (cited in Smith, Cowie and Blades, 2003, pg 497) draws attention to the process of collaborating with another person more knowledgeable not only gives the child new information on that topic but also confirms those aspect that the child does not understand.

Descriptive to Descriptive Reflection

'Descriptive Reflection' is defined by Hatton and Smith as:-

> 'Descriptive - Reflective, not only a description of events but some attempt to provide reason justification for events or actions but in a reportive or descriptive way. For example "I chose this problem-solving activity because I believe that students should be active rather than passive learners" Recognition of alternate viewpoints in the research and literature which are reported. For example, Tyler (1949), because of the assumptions on which his approach rests suggests that the curriculum process should begin with objectives. Yinger (1979), on the other hand argues that the "task" is the starting point.
>
> Two forms:-
>
> (a) Reflection based generally on one perspective/factor as rationale.
>
> (b) Reflection is based on the recognition of multiple factors and perspectives.'
>
> (Hatton & Smith 1995:48)

This is an extract from a student's first draft of reflective writing concerning classroom management. In this the student reflected on the literature giving a descriptive account of the underpinning theory linked to a descriptive account of school policy, reflecting on the

literature and giving an example from classroom experience. From this it was clear that the student considered the importance of the literature and followed school policy recording the benefit of this approach from observations of others, but goes no further than to state it was a strategy he/she tried to integrate into taught lessons.

> Extract One - April: A further reason to integrate talk and discussion into the classroom is based on the arguments of Vygotsky (1978), and his influential theory on the zone of proximal development. He argues that 'children are capable of doing much more in collective activity or under the guidance of adults.'(p.88) this is important because it argues that for learning to be most effective for children, they need to have the opportunity to talk to peers. Having an opportunity to talk with peers is, according to Vygotsky, the most effective way to integrate learning into the classroom, as learning is something that is social rather than an individual experience. Furthermore the idea that learning is a socially constructed process is reflected in the teaching and learning policy of the placement A school, under classroom management and organisation it states that there should be 'group work' and 'collaborative learning in pairs and groups', this is something that I did see taking place in the school, during various lessons.

There is no evidence of feedback given through the e-portfolio. That does not mean that the student did not get feedback, and the fact that the work on the e-portfolio was edited may indicate that the student did receive feedback in another form. During interviews students did report that they had not always received feedback through the e-portfolio, some was given during tutorials, email or on Microsoft Word documents sent back from the tutors with comments.

The same student shows his/her ability to reflect at a higher level as the course progressed. This was an extract from the final submission. Here the student recounts experiences of using the strategy, makes suggestions on how to ensure it is successfully incorporating several factors from one perspective moving from 'Descriptive' to 'Descriptive Reflection'. There was a sense of using the e-portfolio as a means of externalising the internal dialogue (Bolton 2012), the student taking the abstract thought and making a concrete record of that thought. This process may include the revising of thought through the act of recording. First reflecting through a dialogue with oneself,

secondly reflecting before recording in order to share with the more informed other, with a possible third reflection when given feedback. The stimulus for this level of reflection was not apparent but may be a result of additional experience encountered as the course progresses or from further reading.

> Extract Two - June: Based on what I have observed and read I feel it is very important to integrate talk into lessons and it is something that I will be doing for future development. The literature and observations have shown that learning can be a socially constructed experience. However I have found that to have effective talk in the classroom then lessons need to be thoroughly prepared and planned so that pupils are discussing work rather than pooling information together. I have also seen how it is possible, through the use of "talking partners" to integrate talk into schools where space in the classroom can be an issue. However, I would try to have EAL pupils sat next to pupils for whom English is a native language. This is not always possible, however for the development of grammar I feel, based on the literature; it would be more beneficial for the EAL pupil to hear the language being spoken by a native speaker, who has been hearing the language since birth.

Descriptive Reflection to Dialogic Reflection

In this section extracts of work uploaded by three different students is given as examples of how, through the reviewing and editing process, the students have moved their level of reflection from 'Descriptive Reflection' to 'Dialogic Reflection'. 'Dialogic Reflection' is defined by Hatton and Smith as:-

> 'Dialogic Reflection - Demonstrates a "stepping back" from the events/actions leading to a different level of mulling about, discourse with self and exploring the experience, events, and actions using qualities of judgements and possible alternatives for explaining and hypothesising.
>
> Such reflection is analytical or/and integrative of factors and perspectives and may recognise inconsistencies in attempting to provide rationales and critique for example "While I have planned to use mainly written text materials I became aware very quickly that a number of students did not respond to these. Thinking about this now there may have been several reasons for this. A number of students, while reasonably proficient in English, even though they had been NESB learners, may still have lacked some confidence in handling the level of language in the text. Alternatively a number of students may have been visual and tactile learners. In any case I found that I had to employ more concrete activities in my teaching." Two forms as in (a) and (b) 'Descriptive Reflection'
>
> (Hatton & Smith 1995:48)

Descriptive Reflection to Dialogic Reflection, example one

Extracts from another student on the same subject of classroom management revealed how the student has reframed his/her argument through six versions. The first extract (third draft) uploaded in January described how the student had adopted a strategy following observation of more experienced tutors justifying reasons for actions, this reveals how the student had moved from 'Descriptive' to 'Descriptive Reflection'. However, the development of thinking was restricted to considering the events in the localised school experience. The student had not been able to consider the wider implications.

> Extract one - January: Indeed, in practice I have observed teachers being mobile throughout lessons and taking time to visit each working group to monitor work and assess children's ability on-task, which is an example I have followed by ensuring I move between tables and ask each group about their activity, focussing on particular children who require further support where necessary. I have also found the support of Teaching Assistants and Learning Support Assistants in class invaluable to me in assessing children and behavioural issues.

Feedback to the student was not evident on the e-portfolio.

In the second extract uploaded in February (final submission) the student reported from multiple perspectives with a sense of stepping back. The passing reference to the QTS standards indicated an awareness of the need to evidence collaboration with others. No tutor feedback appeared on this element of the e-portfolio, however, the writing has improved moving from 'Descriptive Reflection' to 'Dialogic Reflection' indicating that something happened in a short period of time (one month) that enabled this student to develop the writing. This may have been the process of re-writing, showing that the student is reflecting once again on prior events, deepening understanding of the issue or viewing the issue from a difference stance. This indicated that the development of thinking from reading, experience and reflection has enabled the student to reflect at a deeper level.

> Extract two – February: However, it is through recognition and awareness of the debate in research that practitioners can address and alter their behaviour to overcome any negative issues. For example, I know from research that group seating presents a greater challenge for overall classroom observation than rowed seating, but I make sure I remain mobile in lessons and stand at the edge of the class with my back to the wall, I maintain a greater chance of classroom observation. I also shared planning with the Teaching Assistants (Q33) to enable all adults to be fully involved in the lesson's Learning Objectives, which aided classroom management. I received positive feedback from my mentor for this and it was invaluable to me personally in assessing children and behavioural issues.

Descriptive Reflection to Dialogic Reflection, example two

The student discussed curriculum design through the literature and classroom experience. The first extract followed discussion on multiple perspectives, concluding with the need, regardless of curriculum design, for the development of thinking skills. This extract revealed the ability to articulate the reasons behind the understanding of development of thinking skills, and what the student had researched to back the notion of the argument.

> Extract one - April: The consideration of curriculum design led to an exploration of common themes in implementing the curriculum. This began with a look at the issue of creativity and related to practice through an understanding of a thematic approach to teaching and learning. This developed an argument of the need for the development of thinking skills within children.

No feedback was evidenced from the tutor through the e-portfolio. The second extract infers a 'mulling over' and 'stepping back' from the situation suggesting that the student had moved from 'Reflective Description' of this particular point to 'Dialogic Reflection'. The extract replaced the previous extract one revealing how the student had reflected at a deeper level.

> Extract two - May: This appears to be particularly successful for the younger years because they can make parallels to their own lives, connections are easy to make and a context is provided in order to promote understanding. This approach encompasses the three key areas discussed within this reflection: creativity, thinking skills and understanding. For my future practice this means that I would like to implement a thematic approach. However, it is recognised that the principles of this approach (creativity, thinking skills and understanding) could also be implemented if a creative curriculum is not in practice within a school. It is these

> elements that remain critical in preparing children for their future lives and therefore should be at the forefront of consideration concerning curriculum design.

Descriptive Reflection to Dialogic Reflection, example three

This reveals the student's ability to reflect on action, and suggests modifications to the approach in order to allow peer learning. This 'Reflective Description' focused on the perspective of the student referring to experience of carrying out the assessment together with the perspective from supporting literature.

> Extract one - February: However, when I used peer assessment I did not consider the high order peer assessment questions. On one such occasion in a Personal, Social and Emotional Development input I encouraged the children to discuss what they liked about each other's pictures, although on reflection I could have used this more effectively as to why they liked it and allowed them to make suggestions to their peers as to what could be improved and why. Thus, allowing the children to extend their knowledge and reflections to their peers (Burns and Myhill, 2004). This would have provided the essence of peer learning (Oldfather *et al*, 2003).

The student did not receive feedback on this piece of work. In the second extract, two months after the first account appeared, this same student explained a difference of opinion and what he/she intended to do in the future to avoid the perceived incorrect assessment. There was recognition of two viewpoints and justification for the student's opinion together with a sense of 'stepping back' and mulling over the events indicating 'Dialogic Reflection' in this instance.

> Extract two- April: This child showed the ability and capacity to collaboratively learn with others and demonstrate his phonic knowledge intrinsically. The teacher questioned my observation as her knowledge of this child clearly showed that he was unable to do this. Alexander (2000) suggests that a teacher needs to know her pupils to be able to move them forward in their learning. I felt that the teacher's summative assessment approach stifled this child's need to talk through what he knows and clearly identified her lack of knowledge on how this child learns. Thus, preventing this child from moving his learning forward. I therefore in future planning intend to allow opportunities for children in my class to be able to demonstrate their knowledge and learning though talk, active participation and collaboration (Harlen, 2005). Teachers can make intuitive assumptions on children's learning as time restraints and demands can hinder the time for teacher/peer collaboration (Sadler, 1989). On reflection, a teacher needs to know

> her children and promote active learning to be able to scaffold and challenge their knowledge to move towards their new learning (Burns and Myhill, 2004).

Dialogic to Critical Reflection

'Critical Reflection' is defined by Hatton and Smith as:-

> 'Critical Reflection - Demonstrates awareness that actions and events are not only located in, and explicable by, reference to multiple perspectives but are located in, and influenced by multiple historical and socio-political contexts. For example, "What must be recognised, however, is that issues of student management experiences with this class can only be understood within the wider structural locations of power relationships established between teachers and students in schools as social institution based upon the principles of control" (Smith 1992).'
>
> (Hatton & Smith 1995:48)

Extracts were taken from a student who was discussing the implication of teaching using the National Curriculum with due regard to the recommendations of a government produced paper entitled 'Every Child Matters' (DCSF 2008) and the consequences of personalised learning. In this extract in November the student clearly identified the issue from classroom experience and gave a critique of the observed situations and how he/she would learn from this experience.

> Extract one – November: One positive impact differentiation should have is to reduce boredom (Kerry, 2002) yet in class there were apparent behavioural issues with the lower ability group in maths and English, which I believed stemmed from boredom. Arguably their boredom was linked to both the task they were set and the teaching resource given to support them. Firstly, the task would often be a directed kinaesthetic approach of cutting shapes or words and sticking them in a book, which is not a particularly inspiring task to be faced with each lesson and did not suit all the learners in the group. Additionally, they were frequently tasked to work with the Teaching Assistant (TA) supporting them, but rather than using the scaffolding approach as advised by Wood, Burner & Ross (1976, in Alexander, 2008) the TA often had a more behaviour management approach which only seemed to exacerbate the situation. To learn from this observation, I should ensure that the other adults in my class are used in a variety of ways to support children so scaffolding can be achieved successfully and work with all groups on a rotational basis so no group feels undervalued.

The student did not receive feedback on this work but did revisit and edit the work. In the second extract the student clearly placed the reflection within the socio-political context

and the outcome of the experience was influenced not only by adherence to the thrust of government policy but the localised school context. The student shows from the first extract in November to the final extract in May how he/she has developed his/her thinking from locating the issue in current school practice to considering the issue from a wider view point. This is achieved by viewing the issue from a socially wide perspective, what should happen in all schools, and what the student will incorporate in their own professional practice, together with maintaining the thread of situating the argument in current experience.

> Extract two – May: Whilst considering the pedagogical implications of personalised learning in schools, the psychological well-being of the child should be always be considered. Maslow's Hierarchy of Needs (1978) shows that the effects of placing a child in an ability group or setting them a task which does not conform to their preferred learning style could have a detrimental effect on the feelings of belonging and therefore self-esteem resulting in self-actualisation not being able to be reached. Therefore, the impact of a teacher's actions in class concerning personalisation and differentiation is, arguably, immeasurable. It is of the utmost importance that I am fully aware and remember this and strive towards a personalised learning experience for the children in my class. To put this into practise, I instigated placing the children in mixed-ability pairs which had a positive effect as it appeared to raise the esteem of the lower ability children. By doing this, the work output of these children also increased.

6.3.3 Occurrences of levels of reflection related to categories

Each occurrence of reflection within the five categories was analysed against the Hatton and Smith framework of reflection (see Table 41). The outcome of this analysis clearly reflects findings from the Hatton and Smith (1995) research regarding frequency of occurrences of levels of reflection. 'Descriptive Reflection' is the most frequent type of reflection undertaken by the students and this accounts for just over half of the total data coded, Hatton and Smith also found that the majority of work they coded fell within this category or below. However 30.0 per cent is coded within 'Descriptive', signifying one third of all occurrences remained at the level of description. As in Hatton and Smith's

research, the majority of all occurrences relate to the 'Descriptive' and 'Descriptive Reflection' categories (81.7 per cent).

Table 41. Occurrences of levels of reflection related to categories

Descriptors from Hatton and Smith framework	'Personal Philosophy'	%	'School Practice'	%	'What Literature Says'	%	'Development of Thinking'	%	'Reflection on Literature'	%	Total
'Description'	16	0.5	0	0	468	14.6	149	4.6	332	10.3	965 (30.0%)
'Descriptive Reflection'	501	15.6	394	12.3	0	0.0	243	7.6	492	15.3	1630 (50.7%)
'Dialogic Reflection'	186	5.8	34	1.1	20	0.6	207	6.4	0	0.0	447 (13.9%)
'Critical Reflection'	0	0.0	0	0.0	0	0.0	0	0.0	175	5.4	175 (5.4%)
Total per category	703	21.9	428	13.3	488	15.2	599	18.6	999	31.1	3,217 (100%)

From the total coding, 13.9 per cent of coding was considered 'Dialogic Reflection' and 5.4 per cent was 'Critical' level of reflection. The students were only able to meet the criteria for 'Critical Reflection' within the 'Reflection on Reading' category. This is the only category where they were able to bring together policy, experience, the historical context as defined by the Hatton and Smith Framework. The majority of occurrences of 'Dialogic Reflection' came within the 'Personal Philosophy' and 'Development of Thinking'. Dialogic Reflection could be described as reflection from ones inner self, the externalisation of internal self dialogue. Students seemed to be unable to achieve this level of reflection outside the areas of 'Personal Philosophy' and 'Development of Thinking' (this is what I believe and this is what I will do). Students within this research were unable to evidence this level of reflection when considering issues they were exploring within the wider domain of literature linked to experience.

Frequency of level of reflection per month of course

Analysis of levels of reflection, using Hatton and Smith's framework in relation to each month of the course (Table 42) indicate the development of depth of reflection over time.

Table 42. Frequency of levels of reflection per month

	'Descriptive'	% total	'Descriptive Reflection'	% total	'Dialogic'	% total	'Critical '	% total	Total occurrences	Total % of all occurrences
September	10	1.0	20	1.2	3	0.7	7	4.0	40	1.2
October	65	6.7	203	12.5	20	4.5	3	1.7	291	9.0
November	92	9.5	122	7.5	22	4.9	6	3.4	242	7.5
December	101	10.5	77	4.7	24	5.4	3	1.7	205	6.4
January	16	1.7	31	1.9	7	1.6	0	0.0	54	1.7
February	114	11.8	200	12.3	65	14.5	36	20.6	415	12.9
March	110	11.4	221	13.6	57	12.7	7	4.0	395	12.3
April	140	14.5	198	12.2	43	9.6	31	17.7	412	12.8
May	175	18.1	327	20.1	114	25.5	54	30.9	670	20.8
June	142	14.7	231	14.2	92	20.6	28	16.0	493	15.3
Total	**965**	**30.0**	**1,630**	**50.7**	**447**	**13.9**	**175**	**5.4**	**3,217**	**100.0**

The peak in reflective occurrences during the month of May was due, in part, to the development of their writing over time but also due to the increase in activity on the e-portfolio to meet the final deadline, (see Section 5.6 regarding interactions). However, from February to June the coding for 'Descriptive' increased steadily, with a fluctuation in March revealing that 70.6 per cent of coding for 'Descriptive' appeared during this period, or suggesting that 21.2 per cent of total coding for all descriptors for this period did not progress beyond a descriptive level. However, when considering the coding for 'Descriptive Reflection', 'Dialogic Reflection' and 'Critical Reflection' together for the same period, over 52.9 per cent of all coding appeared in the period February to June, indicating that more than half of the reflection in writing took place during these months. 'Descriptive Reflection' remained steady with a peak in May with 72.2 per cent of coding in this descriptor appearing during this period (36.6 per cent of total coding), 'Dialogic' eighty-three per cent of coding (11.5 per cent of total coding), and the majority of critical coding appeared in the same period February to June, 89.1 per cent (4.8 per cent of total coding). This showed that as the course progressed the frequency of coding in each group

increased, particularly in May, suggesting more text was available during the later stages of the course and also a variance in the level of reflection including more in 'Dialogic Reflection' and 'Critical Reflection'. This suggests that over time students were able to reflect more deeply given the experiential context, lecture input, and, in some cases feedback.

It is interesting to explore the activity the student was engaged with when the coding of reflection took place. Appendix 18 gives the month of course together with the frequency of coding for each context. These figures clearly show that it is during holidays that students complete and upload the highest percentage of reflective work (44.0 per cent), a time when they are not engaged in school practice or lectures. In contrast, work uploaded during school placement account for 10.6 per cent of the occurrences, this figure concurs with students reported perceptions that they did not engage with the e-portfolio during school placement weeks. This suggests that the majority of reflection recorded on the e-portfolio is reflection after action (Schön 1987), when a period of time has elapsed from the actual experience. It is interesting that 20.6 per cent of all critical reflection occurrences took place in February, prior to which 10.8 per cent of all critical reflection occurrences were coded. After this point occurrences of critical reflection become more evident: in April (17.7 per cent), May (30.9 per cent) and in June (16.0 per cent). This indicates a change over time with greater frequency during the later stages of the course.

For the period February to June 12.0 per cent of all coding took place whilst the students were on campus, 5.0 per cent whilst they were in school, 42.0 per cent whilst on holiday and 13.0 per cent during research weeks. These findings concur with the accounts from students' interviews where it was reported that most of the interactions took place outside of school placement weeks (see chapter 5).

6.3.4 Relationship between feedback and depth of reflection

The content analysis reveals that during the month of February there was a peak in the number of occurrences coded in the level descriptors 'Dialogic Reflection' and 'Critical Reflection'. 'Descriptive' and 'Descriptive Reflection' occurrences also increased in February but show that for these descriptors occurrences increase in November and October respectively. In order to explore why the number of occurrences increased in February, feedback from the tutors on the e-portfolio was investigated to see if, as a result of feedback given prior to February, the students' writing improved which would explain a proportion of the increase in reflective occurrences for February particularly for 'Dialogic Reflection' and 'Critical Reflection'.

Analysis of tutors' feedback indicated that such feedback was provided on thirteen pieces of work. Only three students interacted with their e-portfolios in February (Table 43) following this feedback.

Table 43. Occurrences of student interactions and tutor feedback during February

Student	Theme	Tutor feedback prior to February	Date of student interaction (viewed only) with e-portfolio in February	Date of student subsequent edit	Level of reflection of student subsequent edited material
12	What is Learning	18.01.11	25.02.11	03.05.11	13 description 10 descriptive 1 dialogic 1 critical
16	Assessment for Learning	18.01.11	27.02.11	07.05.11 viewed only	N/A
			28.02.11	31.05.11	1 critical
	Classroom management	18.01.11	16.02.11	24.03.11	1 description
			28.02.11	No further work	N/A
17	What is Learning	18.01.11	24.02.11	22.03.11 viewed only	N/A

It cannot be claimed, therefore, that tutor feedback explained the rise of occurrences of students' reflective activity on their e-portfolios in February. However, it is acknowledged that not all the feedback was given through the e-portfolio, as reported by

the students during interviews. Therefore it is only possible to comment on the potential relationship between the feedback given on the e-portfolio and the level of reflection achieved which may have been as a result of this feedback.

Table 43 indicates that three students (twelve, sixteen, and seventeen) received tutor feedback in relation to three themes in January. They read their tutors' feedback in February, and then two students (twelve and sixteen) edited the text they had already uploaded on their e-portfolios at various points between March and May. Assessment of the levels of reflection achieved by these students on their edited text indicated that both of these students reached the highest level of reflection (critical) on one occasion each, but student seventeen made no attempt to edit his uploaded text.

Further analysis of all the material uploaded by the three students was carried out in relation to the development of levels of reflective thinking that were identified in all the writing they had uploaded. Table 44 indicates the changes in levels of reflection following tutor feedback.

Table 44. Changes in level of student reflection following tutor

	Student 12		Student 16		Student 17	
Level of Reflection	Sept – Jan %	Feb %	Sept – Jan %	Feb %	Sept – Feb %	Feb %
'Descriptive'	4.2	6.7	15.1	7.3	16.6	6.4
'Descriptive Reflection'	12.6	13.4	10.8	15.9	26.0	6.8
'Dialogic Reflection'	5.0	5.9	1.3	5.2	3.0	1.7
'Critical Reflections'	0.8	5.0	0	4.3	0.9	0
Total	21.2	31.0	27.2	41.7	46.5	14.9

The tutor feedback was not necessarily related to the theme within which students' text was analysed. There can be no claim, therefore, that the changes in levels of reflection with themes are directly related to tutors' feedback on texts within the same themes. However, given that all students edited their work subsequent to tutor feedback, whether or not this feedback related to the theme within which the text was edited, this feedback

may have prompted deeper reflection from students generally and, therefore influences their depth of reflection in writing across all five themes.

6.3.5 Summary of depth of reflection

The content analysis gave the areas within categories where reflective writing took place. The mapping of these areas to the Hatton and Smith framework gave the depth of reflection within each category of the content analysis. Mapping of the 'Reflective Journal Assessment Reflection Taxonomy' from the course documentation gave the opportunity to compare this to the Hatton and Smith framework. It was evident that although an exact matching process did not take place, the overlaps within descriptions were sufficient to enable the completion of the mapping process underpinning the validity of using Hatton and Smith for the depth of reflection. However, there were issues with using the 'Taxonomy Framework' whose inherent complexity made its use problematic. The coding under the Hatton and Smith framework showed that reflection in writing did take place and that there was variance over time. In addition the analysis suggested feedback may have an influence on future work, students need time to reflect and the opportunity to reflect, 'Critical' reflection occurred in 'Reflection on Reading', and that 'Dialogic' reflection occurred within the categories of 'Personal Philosophy' and 'Development of Thinking'.

6.4 Analysis of reflection

The analysis of written reflections, as they appeared on the e-portfolio, was important in order to identify the depth of reflection and, therefore, whether the use of the e-portfolio achieved its purpose in supporting the development of reflective practitioners. Although it is acknowledged that this research represents case studies of e-portfolio use on one course in one institution over two years, it exposes issues related to reflective thinking

and assessment of reflection. It presents the opportunity to uncover the potential for other ITT courses to consider how reflective practice can be effectively supported.

As previously discussed, all students on this course had the same pattern of experiences organised by the University, with the expectation that they would synthesise their experiences from all elements of their training in the production of their reflective writing for assessment.

Anticipated process of reflection in course design

My initial understanding of the process from reading course documentation and from tutor interviews was that all students would maintain a weekly journal on their e-portfolio, recording their reflection as the course progressed. Therefore, this journal had the potential to represent a record of reflection-on-action (Schön 1987). The student journals would show the development of thinking, and the students would use these journal entries as a catalyst to write the nine assignments on the chosen 'Themes and Issues' (five at Masters Level and four at Professional Level). These assignments would be uploaded on the e-portfolio representing reflection-on-action from all aspects of the students' experiences and would be available for tutors to provide formative feedback at four points in the course. This process is illustrated in Figure 16 and the expected process discussed below.

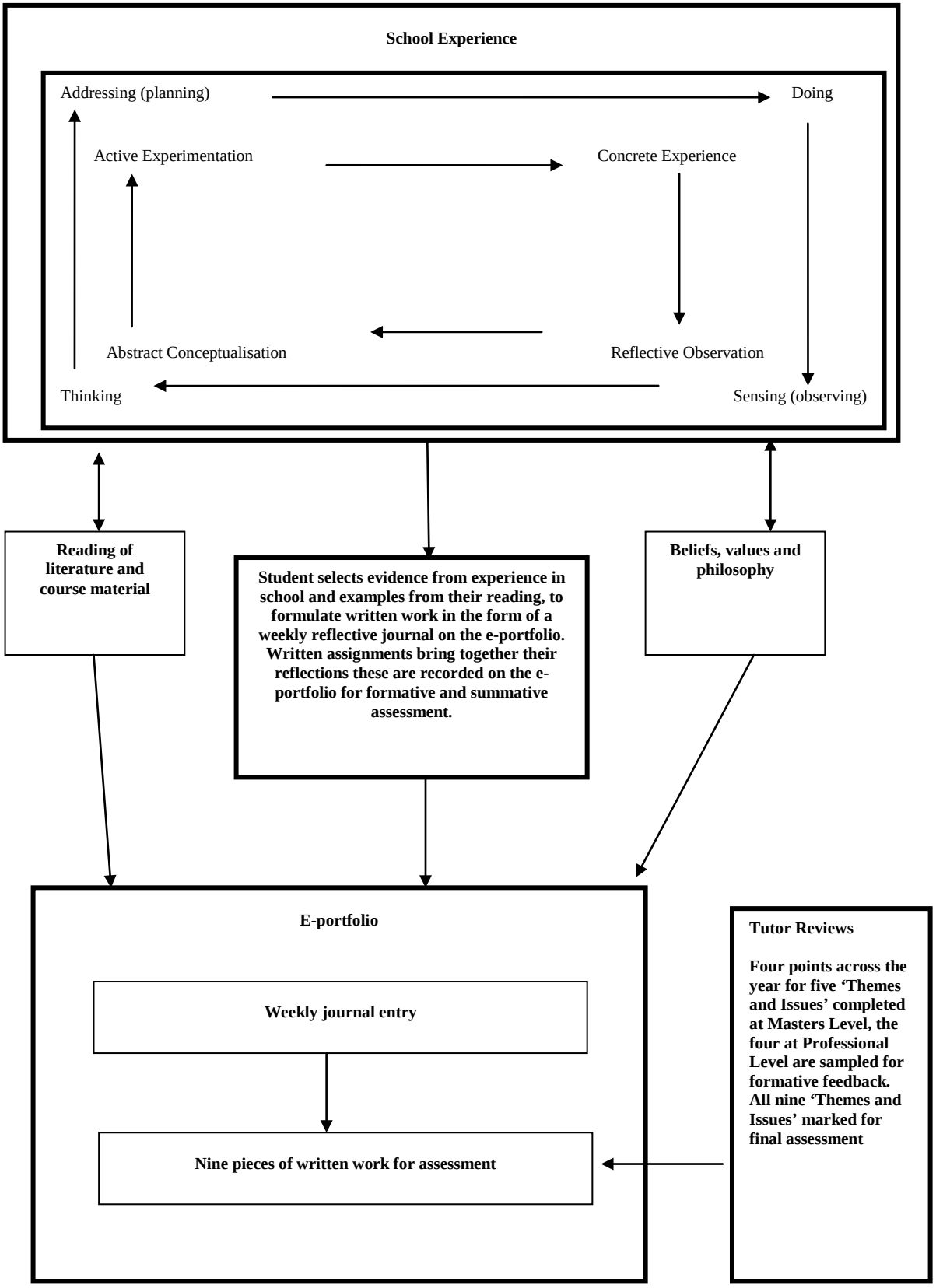


Figure 16. Process of anticipated reflection as understood from course documentation and tutor interviews

Explanation of flow diagram – Figure 16

I understood from course documentation and tutor interviews that there were two different but related anticipated cycles of reflection taking place whilst students were on school placement: a developmental cycle in the abstract professional context and also the experiential cycle in the concrete practitioner context. Therefore, I would suggest anticipated reflection on school placement resembled Juch's (1983) developmental learning cycle of doing, sensing, thinking, and addressing, and Kolb's (1984) iterative cycle of concrete experience, reflective observation, abstract conceptualisation, and active experimentation which were closely linked to form the basis of a model of two cycles of reflection taking place whilst on placement. The process described would appear to indicate that the experiential cycle was reported as a description of what they were doing as reflection on practice in the concrete experience, followed by a second cycle of reflection in the development of thinking cycle, what to do about it. This reflection would be influenced by the literature read and information from course materials. As individuals, all students have previous experiences that influence their understanding. Therefore, beliefs, values and personal philosophy would influence their understanding of school practice and school practice might modify their beliefs, values and personal philosophy.

It was expected that they would use the experiences from school practice supported by their reading and course materials together with their beliefs, values and personal philosophy to write the weekly journal entries. This is where the e-portfolio was intended to be used as a pedagogical tool: to support the learning process as a repository for their weekly reflections, and subsequent written assignments, and a tool to enable for feedback from the more informed other, the tutor.

Findings from content analysis

The purpose of the content analysis as described in this chapter was to discover the process of reflection and how this was achieved by students using the e-portfolio as a pedagogical tool. However, it became apparent from the analysis of written work that students achieved reflected at different levels according to the topic chosen, and used the e-portfolio for different purposes. For instance, work as it appeared on the e-portfolio varied from students uploading one final version of their written reflections for summative marking, others recorded their thinking and developed their writing as they progressed on the course, recording this as notes on the e-portfolio ('Development of Thinking'), whilst some adopted different approaches for different elements of 'Themes and Issues'. Analysis of the case studies in this chapter together with the analysis of the frequency and context of interactions in chapter 5 confirm that students in the sample did not use the e-portfolio as intended in the course design.

The outcome of the analysis in both chapters 5 and 6 indicates that the process of completing the work was as illustrated in Figure 17. Elements from this flow diagram are described below.

School Experience

Content coded as 'School Practice' suggested that the cycles of reflection whilst on school experience were not cycles but were, in fact linear with a starting and end point. I believed this may have been so because students commented on their experiences in school but there were no outcomes, only the reporting of the reflection and no evidence of how the reflective activity would influence future practice. Therefore, there was no evidence to indicate that the reflection from one particular incident would result in transformative learning taking place. Transformative learning was anticipated in course documentation and explained as 'At the end of this unit you will be able to demonstrate

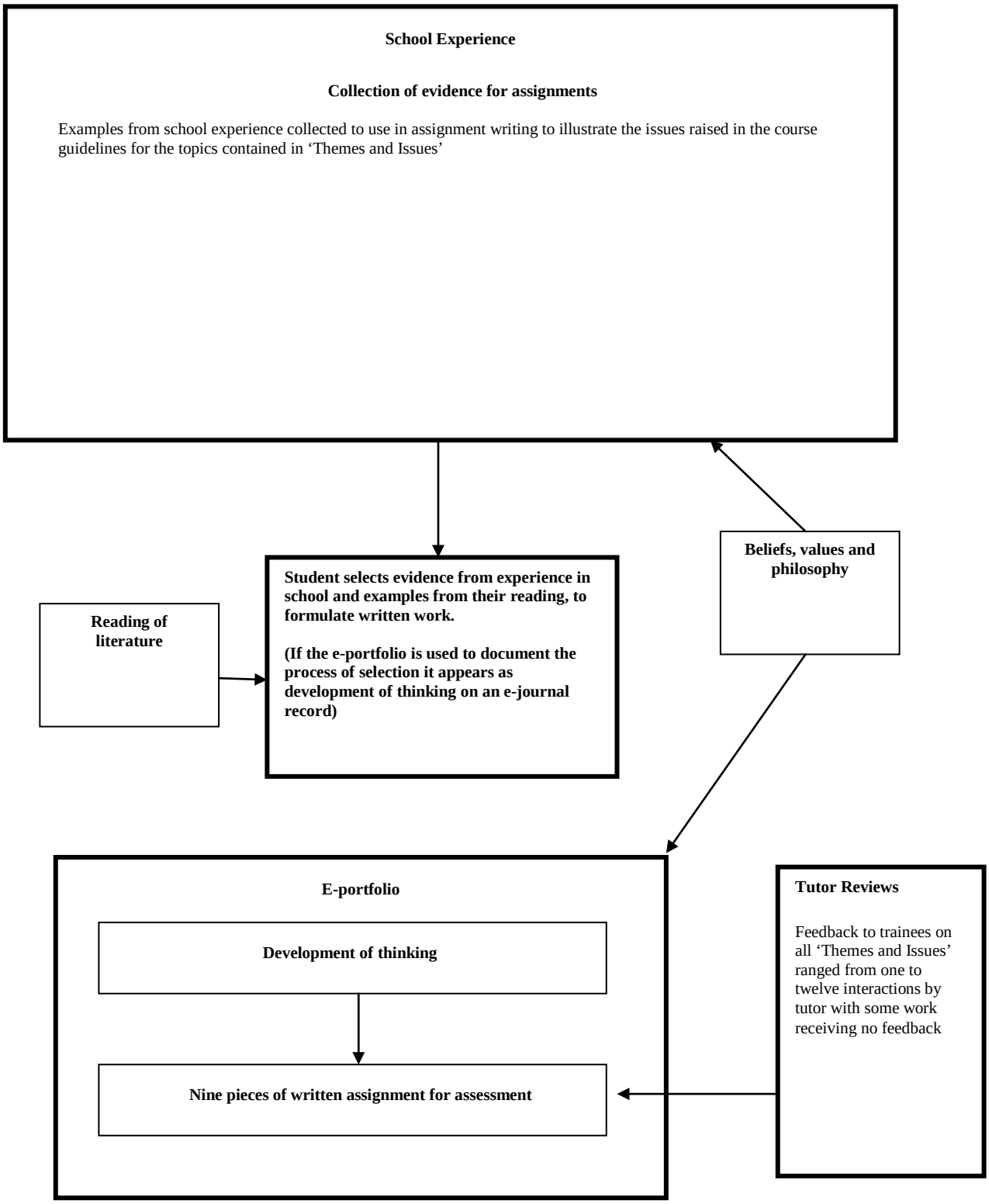


Figure 17. Process of reflective activity as understood through content analysis of written work

personal changes in learning' (Course Handbook 2011:4). With the absence of evidence of outcome it would imply that this may not be a cycle of reflection at all but, as suggested, a linear reflection: reflection on an experience within a context with a clear starting point and end point.

I would put forward the notion that if a course is to support reflective practice then students need to be aware of how that will be achieved through a cycle of reflection, and the criteria for assessment. This assessment should include not just academic benchmarking of achieving an academic level and the level of reflection, but also how the learning from this reflection would be put into practice.

Development in student thinking

Evidence related to 'Development of Thinking' was uploaded before or after school experience but not during school placement. I know this from two sources: students reported in interviews that they did not work on the e-portfolio whilst on placement and quantitative analysis carried out on frequency of use reported in chapter 5 supported their comments. The outcome of their reflections before and/or after the concrete experience of school experience was recorded by some students on the e-portfolio through 'Development of Thinking'. It was at this point that the students recorded their reflections, and it was at this point that those reflections were externalised and available to share with the tutor. This represents the students' awareness of the situation by standing back and meta-thinking on the situation.

'Development of Thinking' was important because it was the first time they exposed their iterative thinking, moving from the intrapersonal to the interpersonal planes (Vygotsky 1978). 'Development of Thinking' might be where the synthesis of information from all other areas took place with an elaboration of the students' understanding of both theory and practice. This point in their development as reflective practitioners seems to me to be

potentially very significant; it is the opportunity for the tutor to work with the student in deepening the reflective process by engaging in purposeful dialogue with the student. This was a time when it was possible for the tutor to encourage students to ponder on their thoughts, to consider other perspectives, to position and re-position themselves revising or modifying their reflections before committing their thoughts to writing for assessment purposes. Thus, it would have provided an opportunity for tutors and students to engage in the co-construction of knowledge. In the content coding students made few references to dialogue with school-based staff, therefore, if this opportunity for co-construction of knowledge with dialogue with the more informed other was missed, the student would approach the writing from their own viewpoint, drawing on their experience without sharing their thoughts with the more informed other, the tutor or school colleagues.

Written reflections

'Reflections on Reading' represented the final part of the reflective process; it was at this time that the student brought together the reflections in all other areas and finalised their thinking. It is an account of two processes: a descriptive account of what has happened through experience and an account of the development in their understanding. This was the writing for assessment using the Masters Level criteria as included in the module handbook. In their feedback to students tutors made reference to this by indicating whether or not the student's writing had reached Masters Level. What did not happen was assessment against the taxonomy of reflection also included in the module handbook; tutors did not provide feedback on the level of reflection as judged against the taxonomy. The feedback that was made available to me indicated that feedback acted as a text editing process to refine the structure of writing to meet Masters Level criteria rather than promote deeper reflective thinking for the student. I reached this opinion because tutors

suggested, through feedback, that the student had not included all the necessary elements and gave the student the opportunity to revise their writing with the inclusion of all relevant material. For example, feedback from tutors included the following comments:-

> "Needs some supporting evidence – how do you know it is complex"
>
> "I think you have all the elements here – what you are lacking is the interweaving of theory and practice"
>
> "Give a specific example of how you planned for pupils with SEN."

From the analysis of the writing I believe that the opportunity to make a difference to reflective thought could occur during 'Development of Thinking'. This was when feedback or access to the more informed other needs to be in place, as suggested above. This stage of the students' thinking represented the student standing back from the situation and engaging in meta-thinking about the situation. The fixing of feedback points during the year, as in this research, did not enable feedback when appropriate for the student, but served to provide a timetable of activities for the tutor and ensure consistency across the tutor group and, therefore, an apparent equality of support for the student. This appeared to me to be about tutor accountability rather than support for students. By tutors acknowledging that 'Development of Thinking' was a time when students could be supported and finding a way of targeting feedback at this point in time, this could potentially influence the outcome of assessed work. This was when the process of constructing learning from the feedback they received was achieved, and considered to be an effective strategy to adopt by writers such as Bain and Mills (2002). This could go some way to overcome the problem put forward by MacKinnon and Erickson (1988) that trainee teachers have a limited repertoire of knowledge and, therefore input from the more informed other at this stage is very important. What the students failed to achieve through their writing was an acknowledgement of how their reflections would influence

children's learning, although one student did ask children for their opinions. This might have been because what was absent from the course documentation was any acknowledgement of children in this process; this documentation was about student reflection and development but not explicitly linked to how this would influence children's learning. It was notable in this regard that the course documentation for this course focused on developing the student teacher's ability to reflect for self-improvement rather than reflecting on the influence the teaching had on pupil progress. The course aims as stated below demonstrate this point in the lack of reference to pupils and their learning:

> 'This unit will:
>
> • enable you to demonstrate personal changes in learning through enhanced self reflection;
>
> • enable you to be critically aware of and be able to deal with complexity, gaps and contradictions in current knowledge, skills and understanding with confidence;
>
> • enable you to be able autonomously to synthesise information and ideas and to have a clear understanding of theory-practice relationships to develop new approaches to changing situations;
>
> • develop your ability to evidence knowledge and understanding from reading, e-portfolio content and interdependent and collegiate working;
>
> • enable you to successfully complete the placement experience;
>
> • enable you to achieve QTS.'
>
> (Module Handbook 2010/11:5)

6.5 Case studies

Three students were selected for case studies – using selection criteria of the highest frequency of coded occurrences, frequency close to the mean, and lowest frequency of reflective occurrences. Student eleven was not considered a suitable candidate for detailed analysis due to non-completion of the course. The case studies reveal how three students approached the five 'Themes and Issues' they chose to work on at Masters

Level, and also how the reflection was supported through the pedagogical tool of the e-portfolio. The work on the e-portfolio was coded as it appeared and only new text added was coded in subsequent additions, therefore the coding for each theme should be viewed as cumulative across the training year.

6.5.1 Case study one (lowest frequency of reflective occurrences)

This student chose to upload Microsoft Word documents to the e-portfolio rather than use the e-portfolio word processing tool completing one theme in February, two in March and two in April. This student chose 'What is Learning' (uploaded 28th February, 2011), 'Assessment for Learning' (uploaded 14.03.11), 'Learning and Teaching Mathematics' (uploaded 21.03.11), 'Differentiation and Personalisation' (uploaded introduction on 19.04.11 and completed work on 20.04.11) and 'Collaboration' (uploaded 20th April, 2011).

For the first three 'Themes and Issues' the student responded to all the questions contained in the theme guidance whereas in April the student focuses on one aspect of the guidance. The subsequent work on 'Themes and Issues' is structured differently with a clear introduction and use of subheadings. On 16th June the tutor looked at all the work on the e-portfolio and uploaded documents with a comment stating that feedback had been given, but there was no feedback on the e-portfolio. The student wrote a comment on the work stating:

> "doesn't seem to be any!"

This suggested that through the act of looking at the tutor's submission and posting a comment the expectation was that feedback would be present.

The reflective occurrences of work on the 'Themes and Issues' submitted for marking at Masters Level, show 'Reflection on Reading' and 'What the Literature Says', totalling

fifty-seven per cent of reflective occurrences, were the most frequent areas in the writing. There was less reference to 'Development of Thinking' (8.4 per cent) and 'School Practice' (fourteen per cent) suggesting that this student focused more on what was contained within the literature as a catalyst for reflection than the other areas (Table 45 and Figure 18).

Table 45. Case study one - frequency and percentage of reflective occurrences per category

Category	Freq	%
'Personal Philosophy'	22	20.6
'School Practice'	15	14.0
'What the Literature Says'	29	27.1
'Development of Thinking'	9	8.4
'Reflection on Reading'	32	29.9
Total	107	100.0

Figure 18 shows how reflection in the different 'Themes of Issues' varied for this student by month, giving a timeline on when he/she worked on the different Themes/Issues.

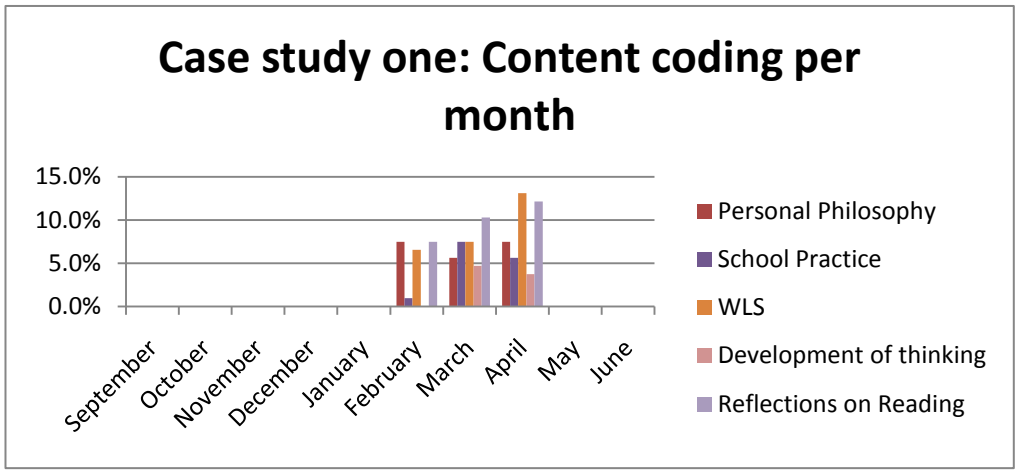


Figure 18. Case study one- reflection coded each month per category

Reflective occurrences for 'Themes and Issues'

Analysis of frequency of reflective occurrences for each theme attempted to show any pattern or irregularities in the routine of the student when working on different 'Themes and Issues', therefore it showed different areas of experience (Table 46).

Table 46. Frequency and percentage of total reflective occurrences in each theme

Case study one	'Personal Philosophy'	%	'School Practice'	%	'What Literature Says'	%	'Development of Thinking'	%	'Reflection on Reading'	%	Total	%
Assessment for Learning	4	3.7	2	1.9	7	6.5	4	3.7	7	6.5	24	22.4
Differentiation and Personalisation	5	4.7	1	0.9	7	6.5	3	2.8	5	4.7	21	19.6
Collaboration	3	2.8	5	4.7	7	6.5	1	0.9	8	7.5	24	22.4
Learning and Teaching Maths	2	1.9	6	5.6	1	0.9	1	0.9	4	3.7	14	13.1
What is Learning	8	7.5	1	0.9	7	6.5	0	0.0	8	7.5	24	22.4
Total	22	20.6	15	14.0	29	27.1	9	8.4	32	29.9	107	100.0

This student appeared to have fewer incidents of reflection in the theme regarding mathematics, and a similar frequency of reflective occurrences in the other four 'Themes and Issues'. For the 'Themes and Issues' Mathematics and Collaboration the student recorded the highest percentage of places of reflection in 'School Practice' and 'Reflection on Reading'. Table 46 clearly shows that for 'Development of Thinking' reflective occurrences appeared in Assessment for Learning and Differentiation and Personalisation, also scoring a high percentage for 'What the Literature Says' and 'Reflection on Reading'. The student shows that the incidents for reflection are not consistent across the 'Themes and Issues'.

Reflection – style of writing

It was interesting how this student wrote in third person but switched to first when making direct comments about school experience for the first two 'Themes and Issues'. For instance:

> "I was constantly reminded to model my expectations of the work, which enabled the children to see how to complete the work before they went to attempt the work"
>
> "I have been reminded of the importance of varied discussions."

He/she inferred that these were personal areas for improvement but did not suggest what he/she would do as a result or explore further. When this student commented on the literature he/she implied that he/she agreed with the viewpoint:

> "We aim to provide."
>
> "Everyone has different views so it is impossible to say one specific approach is best."

Without expanding further, indicating a general acceptance that what he/she was reporting on was a valid point. Observations are made commenting on the wider issues generalising and reporting without evidence of analysis, such as,

> "Children are constantly being assessed."
>
> "This is prominent in education."

For the later pieces of work where the focus is narrower then the analysis becomes more refined giving a scenario and why it was needed:

> "Without training they (teaching assistants) will find it difficult to be confident enough to stand up in front of a class."

This suggested that he/she has had this conversation in school or perhaps a reflection of how he/she felt as a trainee teacher expressing his/her need for development and how this had happened:

> "Looking at different planning helped to inform me and gave me plenty of ideas."

The student provided an appendix for the March theme, an example of a pupil self-evaluation form, and for the final submission a copy of planning, although it cannot be distinguished as to whether this was the student's own planning. The inclusion of the appendices revealed that the student was able to link concrete experiences to theoretical understanding of the issue being explored, making links between professional practice and reading. There was a sense of a final piece of writing for all the 'Themes and Issues'.

The student wrote through the lens of his/her experience, framing his/her writing from reflections on literature rather than drawing on personal philosophy. The reflections were linked to the student's experience of being the teacher, referring to own actions without reference to the community in which he/she worked. As discussion with others can broaden reflection, lack of reference to others may have hindered the ability to reflect at a deeper level (Bolton 2012). Examples from literature are given and then mapped to examples from personal teaching experience or observations, suggesting the adoption of a formula for completion of work, taking a view point from the literature and illustrating this by an example from his/her practice.

Structure

The student develops a structure with the 'Themes and Issues' from writing a continuous piece in paragraphs, to the final theme with a defined structure of an opening paragraph stating what will be covered and then subheadings, five of which ask questions derived from the theme guidance. This allowed the student to explore the issues in a systematic way and in greater depth. For instance under a heading 'How do learning theories help us to understand?' there was a stepping back and considering the implications of the theories from a theoretical perspective and also from a classroom perspective analysing:

> "this is why within a class...."

> "why it is vital to understand and needs to be remembered when thinking about a child's learning, especially younger children".

Depth of reflection

This student revealed that he/she is able to produce work at a deeper level of reflection as the course progresses suggesting scaffolding from a more informed other, although not through feedback on the e-portfolio (see feedback sub-heading below). Over the three months of activity the number of 'Descriptive' reflective occurrences for the period increased, for 'Descriptive Reflection' the frequency increased from February to March with a reduction in April (Table 47 and Figure 19).

Table 47. Case study one – coding of reflection using Hatton and Smith descriptors

	'Descriptive'	%	'Descriptive Reflection'	%	'Dialogic'	%	'Critical'	% total
September	0	0.0	0	0.0	0	0.0	0	0.0
October	0	0.0	0	0.0	0	0.0	0	0.0
November	0	0.0	0	0.0	0	0.0	0	0.0
December	0	0.0	0	0.0	0	0.0	0	0.0
January	0	0.0	0	0.0	0	0.0	0	0.0
February	9	8.4	10	9.3	1	0.9	0	0.0
March	12	11.2	21	19.6	5	4.7	0	0.0
April	21	19.6	16	14.9	10	9.3	2	1.9
May	0	0.0	0	0.0	0	0.0	0	0.0
June	0	0.0	0	0.0	0	0.0	0	0.0
Total	42	39.2	47	43.8	16	14.0	2	1.9

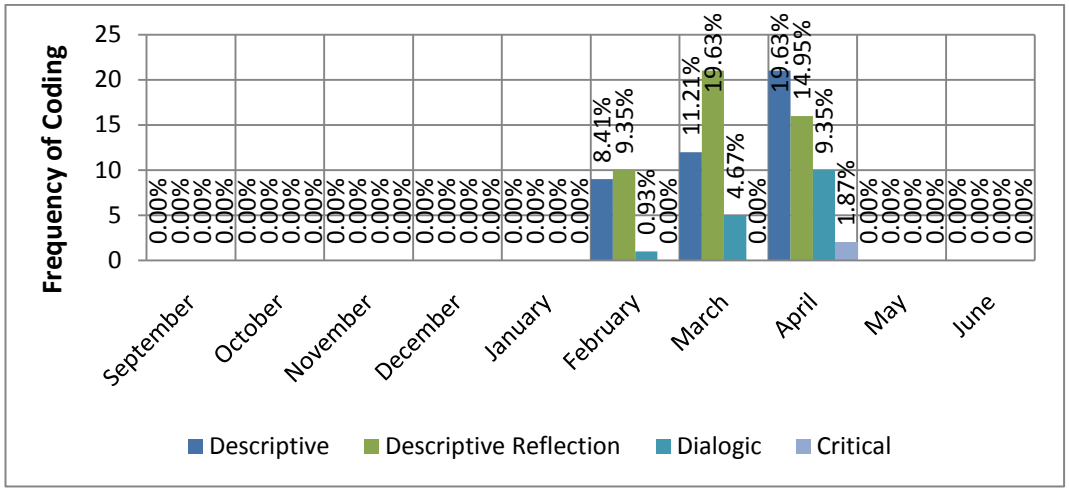


Figure 19. Case study one – reflection against Hatton and Smith descriptors

The total coding in description accounted for 39.2 per cent of the total coding and for both 'Descriptive' and 'Descriptive Reflection' a total of 83.2 per cent. The remaining 16.8 per cent of coding comes from 'Dialogic' and 'Critical'. As can be seen from Table 47 and Figure 19 the coding of content increases through the three months reflecting the number of uploads as would be expected, and does improve with regards to depth of reflection as the course and his/her experience of school and writing moves forward. However, the increase in 'Descriptive Reflection' and 'Dialogic' together with a decrease in 'Description' suggests later submissions have a greater breadth of reflection than the previous months. Therefore his/her increase in 'Dialogic' and 'Critical' coding may be a result of the tighter focus and/or structure together with more experience to draw on.

Feedback

No feedback was provided through the e-portfolio, although it was apparent from the comment the student made on the e-portfolio that he/she was expecting to see feedback. This was due to the tutor stating on the e-portfolio that feedback was included. It is not clear if the student received feedback via a different means, but it is possible that this was

given outside of the e-portfolio. As the student did not use the e-portfolio for revision and editing of work it can be assumed that the e-portfolio did not support this student's reflective practice.

6.5.2 Case study two (high frequency of reflective occurrences)

This student used the e-portfolio to upload material that has been categorised as 'Development of Thinking' as a starting point for his/her responses within 'Themes and Issues'. For instance taking the theme of 'What is Learning?' this student develops the theme through a literature search adding quotes from reading, then adding references from the University website, adding a web-link to a lecture hand-out, more quotes from reading, drafting of reflective writing and then finally checking by viewing only (Table 48). All 'Themes and Issues' are developed in this way and to the same degree with the exception of 'Approaches to Curriculum Design' where the literature search is limited to one source.

Table 48. Case study two - history of use of e-portfolio for theme/issue 'What is Learning?'

Date	Time	What is added	Reading	Word count
07.10.10	2.06 p.m.	7 notes 5 notes 1 note 14 notes 7 notes 1 note commenting	(quotes Burton, 2007) (quotes Akiba, Alkins 2010) (quotes Ylimaki, Jacobson, Drysdale, 2007) (quotes Sharp, Bowker, Byrne 2008) (quotes Coffield, Moseley, Hall, Ecclestone 2004)	
13.10.10	1.25 p.m.	21 notes Adds references from Uni website	(quotes Mercer 2006)	
24.10.10	12.06 p.m.	Adds web-link from lecture		
15.11.10	7.50 p.m.	22 notes	(quotes Claxton, G2007)	
21.03.11	2.22 p.m.	Paper on e-p	Akiba, D. & Alkins, K. (2010), Alexander, R (2008) Claxton, G (2007), Donalson, M (2006), Mercer, N (1995), Mercer, N, Sams, C (2006), Pinker, S (2003)	Word count 1337
31.05.11	9.26 p.m.	Viewed only		

The student uploaded two completed 'Themes and Issues' at the beginning of March and three completed 'Themes and Issues' at the end of May. By March the student would have ten weeks of school experience to draw on, and by May fifteen weeks out of a total of twenty weeks. As the literature search for all 'Themes and Issues' and collection of information from lectures was completed in the October and November, this suggested that before commencing school placement the student was aware of the key aspects relating to each theme, thus being in a position to relate literature to experience and experience to literature. Table 49 shows the reflective occurrences as frequency of

coding and percentage of total coding for the categories, and Figure 20 the depth of reflective occurrences over the duration of the course. For this student the most frequently coded category was 'Development of Thinking'. This was the starting point for the student researching the theme to develop the work. In comparison the percentage of reflective occurrences for 'Personal Philosophy', 'School Practice' and 'What the Literature Says' was relatively low, indicating that this student's writing focused on the literature and experiences with little reference to own belief system. There was an emphasis on the search for theoretical knowledge, with personal experiences compared to this knowledge.

Table 49. Case study two - frequency and percentage of reflective occurrences per category

Category	Freq	%
'Personal Philosophy'	23	7.5
'School Practice'	27	8.8
'What the Literature Says'	19	6.2
'Development of Thinking'	183	59.8
'Reflection on Reading'	54	17.6
Total	306	99.9

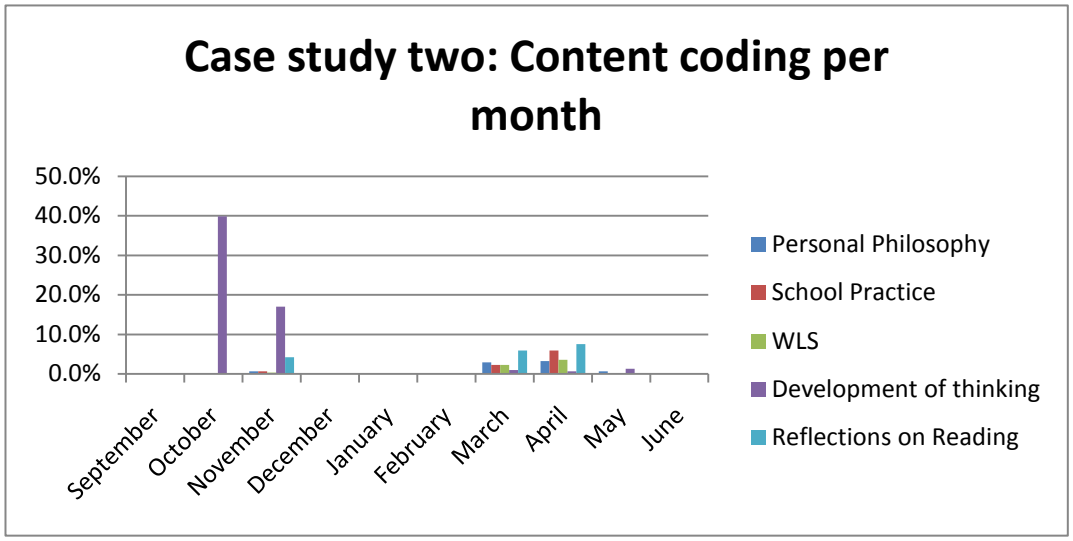


Figure 20. Case study two- reflection coded by level each month

Reflective occurrences for 'Themes and Issues'

Analysis of frequency of reflective occurrences for each theme attempted to show any pattern or irregularities in the routine of the student when working on different 'Themes and Issues', therefore, it shows different areas of their experience (Table 50). This student showed that for the National Curriculum subjects of mathematics and English a high percentage of 'Development of Thinking' was evident.

Table 50. Case study two - frequency and percentage of reflective occurrences in each theme

Case study two	'Personal Philosophy'	%	'School Practice'	%	'What Literature Says'	%	'Development of Thinking'	%	'Reflection on Reading'	%	Total	%
Classroom management	4	1.3	4	1.3	6	2.0	11	3.6	12	3.9	37	12.1
Learning and Teaching English	2	0.6	13	4.2	10	3.3	43	14.0	9	2.9	77	25.3
What is Learning	2	0.6	2	0.7	1	0.3	25	8.2	13	4.2	43	14.0
Learning and Teaching Maths	5	1.6	3	1.0	1	0.3	77	25.2	6	2.0	92	30.1
Curriculum Design	10	3.3	5	1.6	1	0.3	27	8.8	14	4.6	57	18.6
Total	23	7.5	27	8.8	19	6.2	183	59.8	54	17.6	306	100.1

Reflection – style of writing

The student writes in the first person and links reading to examples. The student also explains what was implied:

> "This is hinting at a further function of learning"
>
> "This means that teachers need to..."

The student also uses experience to affirm what the literature is saying:

> "My experience of working with children supports this notion"

as well as suggesting something to take forward:

"Something for my consideration during my next practice"

"This means I need to use strategies in my teaching that will compensate for this".

The writing tended to use the literature and personal experience from the class where the student was working rather than school community in a similar way to case study one. One exception was a reference to using a behaviour management strategy that was not successful where a description of the incident was followed by:

"What I should have done..."

and the analysis,

"This would have been more effective because ...."

The issue was considered from the classroom perspective and compared to the school policy. This theme on 'Classroom Management and Organisation' was also the only theme that considered and directly referred to issues from the wider perspective briefly discussing government policy and making reference to Ofsted. There was a sense of using the reflection through the writing to inform future practice, as if the student was using the experience as fact-finding for future action research:

"This is what I have found out"

"This is how it relates to my current experience"

"This is how it will inform future practice."

Rather than see the work on 'Themes and Issues' as complete, as Case Study one, it was treated by the student as a platform to explore literature and teaching practice in order to inform future practice as a qualified teacher. This gives the impression of the writer as observer rather than active participant. It implies the student was standing back and mulling over disconnecting from the experience, placing him/her as the observer of the experience rather than participant.

Structure

For all the 'Themes and Issues' the student structured the work in a similar way: an introduction, subheadings and conclusion. The introduction outlined what will be covered:

"This will begin with...."

bulleted subheadings under each a description of literature with an example from experience:

"My experience of working with year six certainly supports this notion"

and a conclusion recapped on what had been covered rather than what the student will do as a result such as:

"Having considered the above it can be seen key issues have emerged"

Or,

"The essay began with an exploration...."

Depth of reflection

For this student the majority of reflective occurrences appeared in 'Descriptive Reflection' with an ability to write at 'Dialogic' and 'Critical' levels early in the course. The increase in 'Dialogic' and 'Critical' in March and April may be the result of feedback received earlier in the course (Table 51 and Figure 21).

Table 51. Case study two – occurrences reflection using Hatton and Smith descriptors

	'Descriptive'	% total	'Descriptive Reflection'	% total	'Dialogic'	% total	'Critical'	% total
September	0	0.0	0	0.0	0	0.0	6	2.0
October	13	4.2	105	34.3	4	1.3	0	0.0
November	17	5.6	41	13.4	6	2.0	0	0.0
December	0	0.0	0	0.0	0	0.0	0	0.0
January	0	0.0	0	0.0	0	0.0	0	0.0
February	0	0.0	0	0.0	0	0.0	0	0.0
March	12	3.9	26	8.5	5	1.6	1	0.3
April	13	4.2	33	10.8	2	0.6	16	5.2
May	3	1.0	1	0.3	2	0.6	0	0.0
June	0	0.0	0	0.0	0	0.0	0	0.0
Total	58	18.9	206	67.3	19	6.1	23	7.5

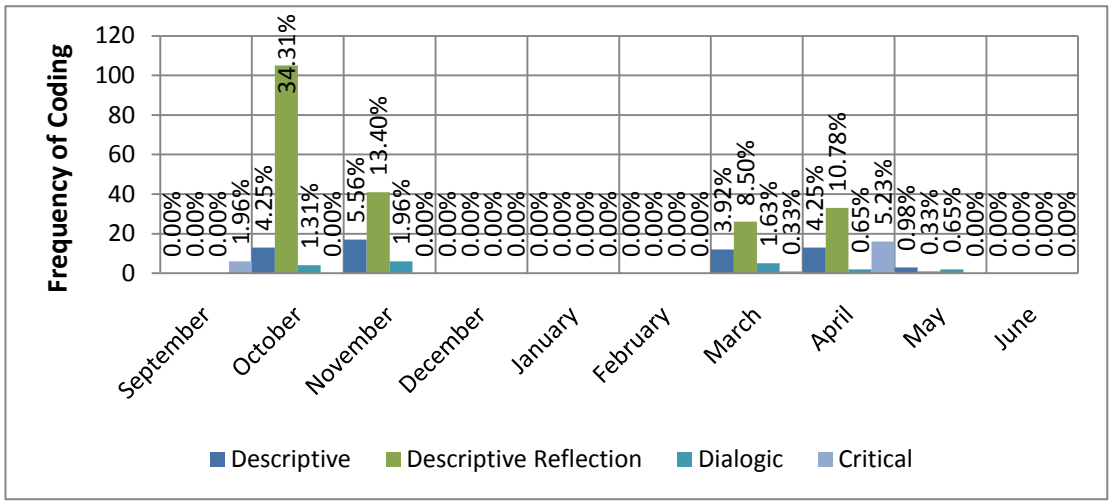


Figure 21. Case study two – reflection against Hatton and Smith descriptors

Feedback

Feedback is given in various ways as follows:

'Learning and Teaching Maths' - two comments in November although this is not through the e-portfolio but copied and pasted on the e-portfolio by the student. Feedback on notes from reading included:

> "Good place to insert personal experience from observation"
>
> "Good place for you to relate to experience – hopefully you will see evidence of this happening in practice".

'Classroom Management and Organisation' – given in March by adding a final comment in a different font colour:

> "Your theoretical writing is excellent however, you really must make your school examples explicit. When you state something from a theoretical perspective you need to give an example from school. E.g. during a maths lesson child A and B were off task so I tried x and y with little effect. On reflection and having discussed strategies with my mentor I did Z. This was much more effective; I tried to maintain this approach during my practice"

The student used this feedback to inform writing and used an example from experience describing an incident and what they would do as a result in the future.

'What is Learning?' and 'Learning and Teaching English' – no feedback by tutor on e-portfolio but uploads in November included comments that may have come from the tutor or alternatively the student externalising thoughts. From 'What is Learning?':

> "Good place to relate to experience"
>
> "It is not a distinct process but linked to all other learning (your thoughts)"

From 'Learning and Teaching English'

> "By assessing in this way you are creating an inclusive classroom by breaking down barriers to learning – your own reflection!"

For the theme 'Approaches to Curriculum Design' no feedback was evident on the e-portfolio.

The underpinning theory of social constructivism would suggest that feedback from the more informed other would have supported the 'Development of Thinking' and the ability to reflect on prior experiences. The advice from the more informed other enabling the student to gain a deeper level of knowledge and understanding in the subject. However, by providing the scaffolding this does not mean that the learner moves on in

their thinking, it is the reaction the learner makes in response to the feedback that will ultimately affect the advancement of knowledge and understanding, or not.

6.5.3 Case study three (mean frequency of reflective occurrences)

This student uploaded the final version of 'Themes and Issues' two in February, one in April and two in May. Table 52 gives the frequency and percentage of reflective occurrences for the categories. This student based the writing with 'Personal Philosophy' as the most frequent coded category implying that this was the starting point for the work, the writing evolving from this base knowledge and this category underpinning the other categories. The two categories of 'Reflection on Reading' and 'School Practice' are similar in percentage of reflective occurrences, suggesting the student has approached these two categories with equal importance.

Table 52. Case study three - frequency and percentage of reflective occurrences per category

Category	Freq	%
'Personal Philosophy'	67	35.3
'School Practice'	44	23.2
'What the Literature Says'	17	8.9
'Development of Thinking'	15	7.9
'Reflection on Reading'	47	24.7
Total	190	100.0

This student's work was coded as shown in Figure 22 to show how this changed over time.

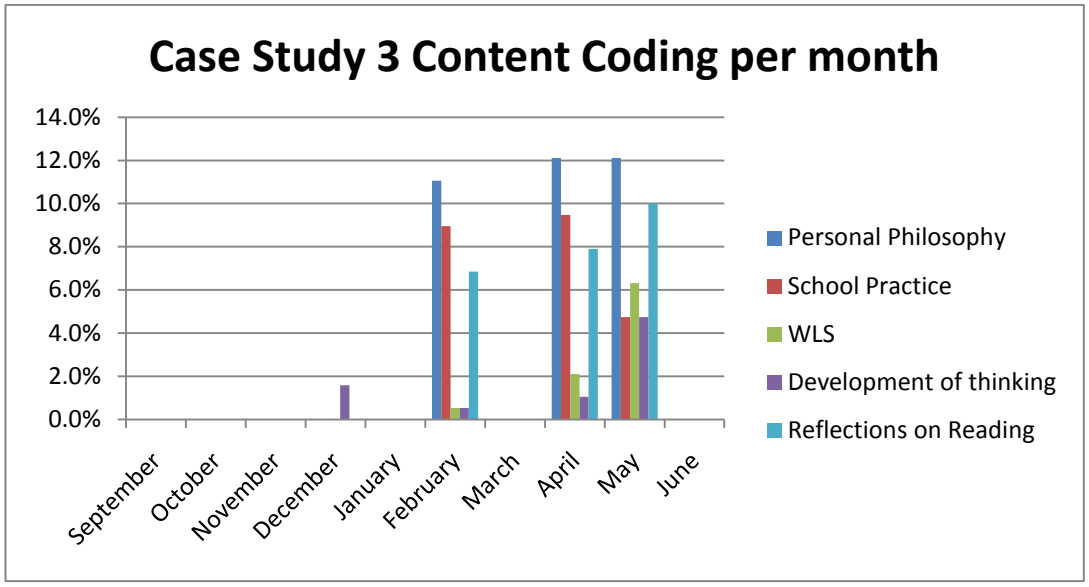


Figure 22. Case study three - reflective occurrences by level each month

Reflective occurrences for 'Themes and Issues'

Analysis of frequency of reflective occurrences for each theme attempted to show any pattern or irregularities in the routine of the student when working on different 'Themes and Issues', therefore, it shows different areas of their experience (Table 53). This student had a higher frequency of reflective occurrences for 'Classroom Management and Inclusion', with 'Curriculum Design' showing the lowest frequency of reflective occurrences. 'Personal Philosophy' plays a large part in the discussion of 'Classroom Management and Inclusion', whereas 'Curriculum Design' was the category that has the lowest overall percentage for places of reflection under the 'Personal Philosophy' category. When looking at the reflective occurrences for all categories, this student placed an emphasis on 'Personal Philosophy' where nearly a third of all coding appears.

Table 53. Case study three - frequency and percentage of total reflective occurrences in each theme

Case study three	'Personal Philosophy'	%	'School Practice'	%	'What Literature Says'	%	'Development of Thinking'	%	'Reflection on Reading'	%	Total	%
Assessment for Learning	13	6.8	6	3.2	4	2.1	1	0.5	8	4.2	32	16.8
Classroom Management	19	10.0	7	3.7	11	5.8	8	4.2	8	4.2	53	27.9
Inclusion	21	11.0	17	8.9	1	0.5	1	0.5	13	6.8	53	27.9
Curriculum Design	4	2.1	2	1.0	1	0.5	1	0.5	11	5.8	19	10.0
Collaboration	10	5.3	12	6.3	0	0.0	4	2.1	7	3.7	33	17.4
Total	67	35.3	44	23.2	17	8.9	15	7.9	47	24.7	190	100.0

Reflection- style of writing

This student approached the writing in a different way to the other case study students in that the literature was considered and then the student looked at school practice as a means of validation rather than supporting what the literature implies. For instance when discussing the literature on assessment states:

> "I decided to test this thinking...."
>
> "I want to examine the impact more closely"
>
> "I have seen this when pupils are encouraged to use what they know"

He/she was able to interpret the literature:

> "This means we should give pupils time"
>
> "I feel means that when more do get on board it can lead to increased pride and success"
>
> "This poses the question as to whether the teacher needs to be present at every group discussion".

He/she agreed with the literature:

> "I think this is a key point and something that I very much followed during my placement."

The student then took this further by analysing the impact:

> "It meant the children were using their own sense of equality and inclusion."

In the 'Approaches to Curriculum Design' he/she was able to explore the historical context from a national perspective, along with the outcomes of current research on cross curricular teaching and relate to school experience. There was a short description but the student took this one step further by asking the children what they think:

> "Talking to some of the pupils about their work it is clear that they enjoy it and learn an incredible amount through the medium of the topic itself."

Then links this to current government policy and expresses the opinion:

> "This kind of approach also seems to reach beyond simply accessing learning, it is also a chance for the pupils to challenge the status quo."

Finally the student refers back to literature and concluded:

> "Greater flexibility may offer the chance for more schools to allow access to learning for more of its pupils."

There emerges a circle of own 'Personal Philosophy' followed by reading the literature, an intention of what will do as a result (finding out what happens in school), linking this back to the literature and expressing an opinion on the validity. Although there was reference to personal experiences the discussion was based on reflecting on the school as a community and how this influences the children. This was most apparent when discussing assessment where he/she takes the national expectations along with Ofsted inspection criteria, the school policy to see:

> "If it is being adhered to across the school."

He/she talks to children about a recent assessment and then referred to an analysis of teachers' marking. Although there was no expression of "this is what I will do as a

result", this is inferred through the identification of what was successful, or not. The student clearly understood the issue from different perspectives,

> "I have touched on some, which are of particular interest to me and of relevance to my current placement school as well as being in the public domain."

Structure

The structure of the submissions differs, for instance, in February one had sub-headings, one no sub-headings, in May two had sub-headings, one did not. Although the presentation structure varied, the structure of the writing remained constant, with an introduction giving an example from reading and what he/she will do as a result in the paper, exploring reading comparing to school practice, with a conclusion of how this happens and, in some places, why. Although reference was made to own teaching the emphasis was on the school as a community and reference was made to the children as a voice in the learning process. One theme, 'Collaboration with Parents', was approached differently where the student makes notes on the e-portfolio of what has been seen in school placement and adds hyperlinks to course hand-outs. This implies a planning stage of bringing together of own thoughts

> "I will focus on..."
>
> "What more could be done"

and advice from lectures with intention to

> "Add more here after lecture on Collaborating with Parents."

Depth of reflection

As can be seen from Table 54 and Figure 23 this student wrote for the majority of time in the 'Descriptive Reflection' category, improving the level of reflection towards the end of the course, suggesting that the process of using the e-portfolio may have had an influence on the depth of reflection.

Table 54. Case study three - reflective occurrences of reflection using Hatton and Smith descriptors

	'Descriptive'	% total	'Descriptive Reflection'	% total	'Dialogic'	% total	'Critical'	% total
September	0	0.0	0	0.0	0	0.0	0	0.0
October	0	0.0	0	0.0	0	0.0	0	0.0
November	0	0.0	0	0.0	0	0.0	0	0.0
December	1	0.5	1	0.5	1	0.5	0	0.0
January	0	0.0	0	0.0	0	0.0	0	0.0
February	3	1.6	29	15.3	14	7.4	7	3.7
March	0	0.0	0	0.0	0	0.0	0	0.0
April	14	7.4	37	19.5	11	5.8	0	0.0
May	18	9.5	35	18.4	18	9.5	1	0.5
June	0	0.0	0	0.0	0	0.0	0	0.0
Total	36	19.0	102	53.7	44	23.2	8	4.2

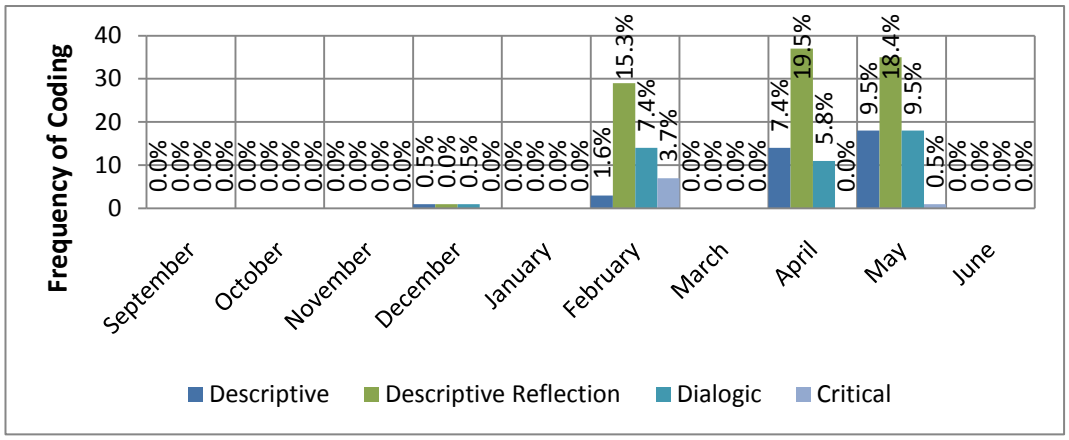


Figure 23. Case study three – reflection against Hatton and Smith descriptors

Feedback

Feedback is given on three 'Themes and Issues', one as a final comment and two comments throughout work.

18.01.11 – on notes

> "A good start – as you progress I know that you will interweave reading and practice. You are already noting what can be done which is great."

18.01.11 – on submitted work

> "This is really good reflective writing journal entry, you are clearly reading and making links to your practice. The language you use is clear, concise and appropriate, well organised. I have graded this at M level."

03.04.11 - on submitted work

> "A very good start"
>
> "This section is well written and makes clear links to theory and practice, writing at M level solid"
>
> "Avoid this phrase as you are not writing an essay"
>
> "I would argue this is not a problem..."

Although the student does interweave reading and practice as suggested in the final upload, following the other two feedbacks the student does not look at these areas of the e-portfolio again suggesting that the student did not see the feedback and the comments did not influence later submissions. Alternatively as the tutor had marked these as working at Masters Level the student had no motivation to improve the work, suggesting that the motivating factor for this student was achieving Masters Level. Therefore, feedback cannot have been why the student was able to reflect at a deeper level.

6.5.4 Discussion of reflective writing in case studies

In all cases the reflective occurrences for 'Descriptive Reflection' happened more frequently. This reflects the findings of the Hatton and Smith research. What was interesting was how the student in case study two approached the completion of the 'Themes and Issues' differently from the other two, adopting a process of recording background reading before compiling the papers on the 'Themes and Issues'. This resulted in the majority of reflective occurrences in 'Descriptive Reflection' but also nineteen per cent in 'Descriptive'. For this student the way the e-portfolio was used prompted a higher frequency of reflective occurrences, coding of notes from reading

together with personal unstructured thoughts. Whereas for the other two students the coding was, in all but one occasion, based on the final submission of one upload per theme. All students used the literature as their starting point, seeking examples from experience to support that stance; this may be reporting reflection-in-action with the student thinking about the events and relating them to previous reading or reflection-on-action which takes place after the event (Schön 1987). As the students reported that they did not complete the 'Themes and Issues' during school placement then it would be most likely that the reflection is after the event. The model of reflection adopted by the course encouraged a deliberation over time with the possibility of drawing together experiences from different placements. For the Case Studies one and two this did not appear to happen and the 'Themes and Issues' were written about one placement in one school.

Case Study three referred to the children as an integral part of understanding what was happening in the school environment, and found out what the children felt. As this student also used 'Personal Philosophy' as the starting point it would suggest that this student valued their perspective. This student framed the writing differently by considering literature as a starting point before going to experience, the experience of the children then synthesising these views, taking the literature to the experiences which came after the analysis of literature. It is by reflecting in this wider context that appears to enable breadth of reflection (Luttenberg & Berger 2008).

Analysis of the students' work illustrated in the case studies revealed that considering multiple perspectives, particularly the focus on the school as a community, as shown by Case Study three, enabled the students to reflect deeper that those students who follow the guidelines for approaching the work with the emphasis on examples from personal experience. The other two case studies appeared to draw together literature mapped to

experiences as the framework for their writing, although one of these students documented the research process before attempting the work.

This appeared to agree with the view that reflection is reduced when top-down visions are imposed, such as assessment criteria or guidance, leading to compliance from the individual (Bolton 2012) and assessed in the same way as a written assignment (Creme 2005). However, the guidance from the tutors encouraged the students to give examples from experience and link this to literature, suggesting that this may be a reason for 'Descriptive Reflection', alternatively it may be argued that this was due to the fact that they are trainee teachers and have not had the experience to reflect at a deeper level. Gomez considers that when reflecting with narratives from classroom experience students' reflection was 'unchallenging and non-risk taking' (2000:744). This is referred to as reflection at a technical level, the evaluation of their teaching and not connected to the development of teachers (Dymoke & Harrison 2008). This suggests that reflecting in a professional capacity as a teacher was, as stated by Black and Plowright (2010:256) 'complex and sophisticated' requiring the individual to consider incidents beyond the evaluative phase of reflection on their actions in one context and from one perspective.

'Dialogic' and 'Critical' reflection are the least evident. It is suggested that to satisfy the criteria for coding the writing as 'Dialogic', it must be constructed in a certain form, which implies a genre for writing rather than a classification of reflection (Hatton & Smith 1995). This implies that if students are able to construct using a particular genre this could be a taught strategy. It may have been the case that if the students had been given a more simplistic taxonomy of reflection to work with which feedback referred to, their level of reflection may have been deeper. By using a simply worded framework they would have been able to use the guidance contained therein to ensure they met the criteria, and therefore able to write at a deeper level. This illustrates a major problem

with using e-portfolios for assessed reflection. Should tutors be placing an assessment framework on reflection and, if so, does this framework help and support the reflection that is taking place or enable the student to write for the test? In addition, how can students remain honest in their reflections when they may hold views and values that are dissimilar to the tutor or political context?

Table 55 compares category reflective occurrences for the case study students and Table 56 the comparison for depth of reflection. What comes across in these three case studies is the low priority given to the reflection of 'School Practice'. On the one hand this was not surprising given the amount of work students had to complete and also the number of new experiences and bodies of information with which they had to contend. From the course point of view, however, this may be seen as a very disappointing finding given that the development of 'reflective practice', implying the integration of theory and practice and reflection on this, is accorded such high focus in the expressed course aims. There was a difference in total frequency of coding for each student which does reflect the amount of work each one completed on the e-portfolio. Case Study one had a total of 107 coded occurrences over the five Masters 'Themes and Issues', Case Study two a total of 306 and Case Study three a total of 190.

Table 55. Comparison of frequency of reflective occurrences by category for case studies

	'Personal Philosophy'		'School Practice'		'What Literature Says'		'Development of Thinking'		'Reflection on Reading'		Total	
	freq	%	freq	%	freq	%	freq	%	freq	%	freq	%
Case study one	22	20.6	15	14.0	29	27.1	9	8.4	32	29.9	107	17.7
Case study two	23	7.5	27	8.8	19	6.2	183	59.8	54	17.6	306	50.7
Case study three	67	35.3	44	23.2	17	8.9	15	7.9	47	24.7	190	31.5
Total	112	18.6	86	14.3	65	10.8	207	34.3	133	22.1	603	100.0

From the percentages for each category it could be interpreted that the approach used by case study three proved to be the most successful with regards to achieving higher levels of reflection in the writing ('Dialogic' and 'Critical' sum of 27.2 per cent), while case study one and case study two coding for 'Dialogic' and 'Critical' totalled 16.9 per cent and 13.7 per cent respectively (Table 56).

Table 56. Comparison of Hatton and Smith descriptors for case studies

Case Study	'Descriptive' %	'Descriptive Reflection' %	'Dialogic Reflection' %	'Critical Reflection' %	Sum of 'Dialogic and Critical' %
One	39.3	43.9	15.0	1.9	16.9
Two	18.9	67.3	6.2	7.5	13.7
Three	18.9	53.7	23.2	4.2	27.2

Analysis of the results of coding of reflective occurrences for the other students in the sample show that three other students also have a sum of 'Dialogic' and 'Critical Reflection' above twenty-seven per cent of the total amount of coding for all work (Table 57). Scrutiny of work carried out by these three students reveal that they approached the work in a similar manner to Case Study three by considering multiple perspectives.

Table 57. Percentage of statements classified using Hatton and Smith (1995) framework of reflection

Student	'Descriptive' '%	'Descriptive Reflection '%	'Dialogic Reflection '%	'Critical' %	Sum of 'Dialogic' and 'Critical' %
1	35.1	45.9	11.6	7.8	19.4
2	39.3	43.9	15.0	1.9	16.9
3	34.0	44.5	29.5	2.0	31.5
4	18.9	67.3	6.2	7.5	13.7
5	30.3	52.4	14.6	2.8	17.3
6	28.4	59.1	12.6	0	12.6
7	0.5	39.0	10.3	0.7	11.0
8	18.9	53.7	23.2	4.2	27.2
9	19.1	58.6	14.3	8.0	22.3
10	21.9	40.8	21.9	15.4	37.3
11	0.3	50.0	15.8	7.9	23.7
12	31.1	41.2	14.3	13.4	27.7
13	26.8	51.8	15.5	6	21.5
14	22.0	52.5	22.0	3.4	25.4
15	0.5	35.5	7	2.6	9.6
16	33.3	47	13.8	6	19.8
17	30.2	57.9	8.9	3	11.9

Although students' approaches may have been similar, when considering the content analysis in the categories they do not appear to follow the same pattern as that of case study three, as Table 58 below indicates.

Table 58. Content analysis for those students who score higher than 27 per cent for 'Dialogic' and 'Critical' depth of reflection

Student	'Personal Philosophy'	%	'School Practice'	%	'What Lit Says'	%	'Dev of Thinking'	%	'Reflection on Reading'	%	Total
Three	61	30.5	11	5.5	36	18.0	41	20.5	51	25.5	200
Ten	40	19.9	27	13.4	37	18.4	34	16.9	63	31.3	201
Twelve	11	9.2	16	13.4	22	18.5	24	20.2	46	38.7	119
Case study three	67	35.3	44	23.2	17	8.9	15	7.9	47	24.7	190

As can be seen students three, ten and twelve score a similar percentage in the frequency of reflective occurrences for 'What the Literature Says', however the percentages in 'Personal Philosophy' are diverse although there are similarities when comparing 'Development of Thinking' for student three and twelve, 'School Practice' for ten students and twelve (Table 58). This table suggests that other than the fact that the total percentage for 'Dialogic' and 'Critical' depth of reflection was above twenty-seven per cent and that there was similarity in the percentage of coding for 'What the Literature Says', there appears to be no other common factor shared between these students.

For student three, 'Dialogic Reflection' accounts for 29.5 per cent with a relatively small percentage of two per cent for 'Critical Reflection'. The student considered the national perspective, then the local comparing both placement schools, with brief reflections relating to own teaching experiences such as:

> "Firstly the notion of collaborative learning will be explored."
>
> "I have witnessed and experienced in school" then links the argument to the classroom "Classroom environment must meet the needs of the students."

often backed by his/her 'own opinion'

> "For exploratory talk to be meaningful, it needs to be guided or scaffolded."

The writing is approached by investigating multiple perspectives which are commented on by expressing own opinions:

> "Which I found insightful."
>
> "Good communication is an integral part of building a collaborative relationship."

This student does not give examples from his/her own teaching practice but comments broadly on the observations of the school communities in both placements making general observations rather than explicit examples.

For student ten, the work was structured by considering multiple perspectives. Comments on the national context are followed by the local context then sub-headings for the various issues to be investigated. The local context covers both placement schools by stating:

> "I will analyse the ways that School A and B try to involve parents in their child's education."

The literature was threaded throughout the writing and after considering the national and local perspective brings the issue back to self by suggesting:

> "This is something that I have started to do."
>
> "Enabled me to meet many of the parents."

The conclusion of the theme illustrates how the student had considered the theme from multiple perspectives:

> "This theme has enabled me to find out about different perspectives and research on effective parent-teacher partnerships and it has reinforced my own beliefs that this is of vital importance."

For student twelve, again considering multiple perspectives, with reference to both schools, the introduction stated that the writing:

> "Aims to examine how schools are able to provide"

and what he/she intends to do from investigating literature and placements

> "What can be done in my future practice as a result of this reflection."

This student gave examples from literature, compares with local contexts and makes judgements on the practice in schools:

> "This is important"
>
> "I have observed it has been possible"

and then referring to own experiences,

> "I have found in my own lessons."

These students are writing about a wider community, considering multiple perspectives rather than focusing on what the literature says and how to illustrate this from personal experience. This might be an indication of why they are able to write with this depth of reflection as they are widening their view of the issue beyond the classroom experience.

6.6 Overall discussion of findings

Analysis of the e-portfolios allowed the research to investigate the way in which the students interacted with the content and how they reacted to the feedback received. The reflection cycle, (see Section 6.4 and Figures 16 and 17) identified the process of reflection in relation to the categories where reflection took place. The role of the e-portfolio in supporting this process was evident from the analysis of Case Studies two and three.

The students' whose work is described in case studies two and three achieved Masters Level for their work. They approached the completion of the work differently to Case Study one that used the e-portfolio solely as a repository. Case Studies two and three used the e-portfolio to record their learning journey and revealed their development of thinking as the work progressed. Case study three approached the work by considering the literature and then seeing what happened in school, focusing on the children. The achievement of Masters Level may be due entirely based on the academic ability of individual students rather than the influence the e-portfolio has in supporting reflection. However, case study two and three, by working with the e-portfolio in a different way showed how they were constructing their knowledge and therefore it is possible for tutors to provide feedback on the process. Whereas for case study one the tutor would only be able to feedback on the finished work and not be able to support the construction of knowledge during the process.

6.7 Summary and personal reflection

This section aimed to address the two research questions 'How are e-portfolios used by trainee teachers?' and 'Is there is relationship between the use of e-portfolio and the development of reflective learners?' The above revealed that those students who share a similar profile with Case Study three with regards to percentage of 'Dialogic' and 'Critical' reflections totalling over twenty-seven per cent approach the work in a similar way. This is by using their 'Personal Philosophy' as a starting point, stating this is what I believe in and then finding out from the literature and experience if 'his/her own belief' is valid. There is also a sense of considering the issue from the perspective of the children. This may infer that in order to attain a greater depth of reflection when work is assessed against a framework of reflective activity the student is required to approach the work in a particular way.

Further findings suggest that reflection is a contested concept and in this study it is used for evaluation, therefore there has to be a means of indicating the progress made. This implies that in order to evaluate the progress made, an assessment of the starting point and the level achieved at the end of the assessment period needs to be made. Without a hierarchical chronological record of achievement then it is not possible to assess the improvement in ability to reflect. The taxonomy used on this course was complex and it was not possible to assess the level of reflection without encountering issues regarding the hierarchy of statements within each level, the expectation of meeting every statement in a level and the understanding of what each individual statement meant without clear examples to illustrate the point. One implication of having a structure in place to assess reflection is that students will attempt to write to the test, they will know what the work has to look like in order to pass the test and will write accordingly. However, not having a structure for evaluation is problematic and creates difficulties in assessing the outcome

for the tutor and knowing what is expected by the student. This is the dilemma and part of the problem with assessment. A tight structure may result in students writing to the test, without a structure then it is impossible to assess as you cannot assess without a structure.

The results largely reflect literature about the usefulness of e-portfolios as repositories, despite their intended purpose within the course, and that dates for feedback and the deadline for completion of work result in increased activity on the e-portfolio.

In addition, the analysis of work indicated that although trainee teachers approached the topics in different ways the level of reflection did change over time, suggesting that studying on this course did encourage them to become reflective thinkers. The way in which a student approached the work may influence the outcome of the reflection that took place. It appeared that students approached the 'Themes and Issues' mathematics and English in a different way to those 'Themes and Issues' on generic educational focal points.

The e-portfolio represented a pedagogical tool used on part of this course and may have contributed to this change in reflection. It may be through using the e-portfolio the students gained a depth of reflection by publishing their work, but there is not sufficient evidence from this analysis to support this view. Feedback on individual 'Themes and Issues' did not necessarily mean that the student will act on the feedback and improve the work. It is clear that the tutors needed a shared understanding of how feedback should be given in order to promote a deeper level of reflection. Feedback did not always support development of reflection due to ambiguity.

Tutor skills in using the e-portfolio tool are pivotal in the successful implementation, together with a clear design with transparent course expectations and theoretical underpinnings, which will assist in the promotion of a shared understanding of purpose.

Tutors and students are then more likely to understand their roles in the process of e-portfolio construction. The process and product of the e-portfolio can then be assessed against a mutually understood framework. Feedback that is linked to a clear framework will allow the student to improve depth of reflection that is closely related to an understanding of how depth of reflection is to be achieved. With these elements in place the intended outcomes of using the e-portfolio as a pedagogical tool is more likely to be successful.

Reflection

As discussed at the beginning of this chapter, this process was challenging for me as a researcher. At the end of the process of data collection and analysis, I spent time considering the findings but also how these findings related to my own experience as a researcher and a professional working within ITT. This involved looking beyond the findings with a close examination of my relationship with the participants in chapter 5 which documented the face to face contact through interviews, and the work for this chapter which explored reflection, not in a personal context, but by viewing the data without any connection to the author. This gave me the opportunity to explore my research and compare the way in which data collection involving a relationship with the participants and data collect without any relationship with the author had evolved. Both elements of the research had been immensely rewarding in terms of understanding the complexities of the student and tutor experience, and the influence these findings have had on my personal development. It has been by telling the story of the main study, and, also questioning my own position that I have been able to co-construct knowledge of this particular situation (Steier 1991).

Implications for ITE

I would suggest that in order to support students in reflective practice, providers of ITT need to be aware of the pattern of student interactions, and the context for these interactions as well as understanding how students approach reflective writing. Through this awareness they might be in a position to further support the development taking place. For instance, in this research, expecting students to maintain a weekly journal on their e-portfolio was unrealistic as the students, as reported through interviews, did not have the time to do so whilst on school placement. The design of the e-portfolios in both the pilot study and the main study required a separate weekly journal for each 'Theme and Issue' because this was how the e-portfolio was designed. This might have been achievable with one weekly journal in one area of the e-portfolio which would bring together the student's holistic experience rather than the segmentation of experiences into different 'Themes and Issues'. Targeting feedback during the early stages of reflection would give the opportunity for co-construction of knowledge that the student could take forward in their written assessed work. However, this is difficult to achieve. Tutors have busy timetables and students may require feedback when they are ready, which may differ from when tutors are available. This is the dichotomy for courses that are underpinned by social constructivist understandings. I would posit that if a weekly journal had been kept and tutors were able to give feedback at a point in time when it was required, this would have provided an opportunity for tutors to give generic feedback on how to achieve depth in reflection. There would be implications in terms of tutors' workload, but it might have had a positive influence on personal development of tutors as well as students.

Assessing reflection by imposing a structure is problematic. However, as suggested by Avraamidou and Zembal-Saul (2003), an end product is necessary in order to know that reflection has taken place.

If the purpose of assessed reflection is for the students to demonstrate improvement in their reflective thinking, there needs to be a transparent assessment process showing how the students can improve their skills of reflection. This would require an assessment at the beginning of the course, so a starting point can be determined, together with an assessment at the end in order to measure the progress. However, if the purpose of written work is for evidence of achievement at Masters Level, there is a need to apply a structure of academic benchmarking to a student's reflection. There is an implication when assessing reflective work against an academic benchmark, that there is parity between academic success and depth of reflection. How reflection is assessed, or if it should be assessed and if assessed writing is the best way of encouraging reflection needs to be considered in the design of courses. I would also suggest that if the course handbook includes a taxonomy of reflection, as on this course, this should be referred to in feedback to encourage deeper reflection. If not, then one must question the reason for its inclusion in course documentation. However, using a structure that shows reflection along a continuum and applying this to written work suggests that the ability of the student to reflect at a deeper level is linear. This may not be so as this assumes that if deep reflection takes place in one area of their experience this depth will be achieved in all other areas. By assessing in this way the writing is seen as a product which is used as a proxy for the process, assuming the assessment of a dynamic process is synonymous with assessing a product and ignoring the dynamic movement of a process. Therefore, ITE policy makers and course designers face a dilemma in defining what constitutes reflective thinking and practice as this is the starting point for designing a course for assessed reflection. This may be considered in terms of an understanding of what

constitutes professionalism and the need to find an authentic place for both competencies and reflective thinking. As suggested by Hackett although these two concepts come from different theoretical foundations 'there nevertheless exists between them a compatibility or complementarily that makes it possible for them to be combined in the practice of education or training' (2001:111). One way to achieve this would be to analyse, as in this study, the depth of reflection in different contexts. The results of the analysis in the Case Studies indicate that the depth of reflection is connected to the content analysis category codes. For instance, descriptive reflection was found in all category codes with the exception of 'What the Literature Says', and critical reflection in 'Reflection on Reading, a category where the student is making links between all elements of their experience. This is an aspect of assessed reflection that would benefit from further research to inform course design.

As proposed by Leitch and Day (2002), trainee teachers reflect in different ways and at different times of their practice. I put forward that the ability to reflect is related to the student's depth and breadth of knowledge on a given subject. It does not follow that a student who reflects deeply on one subject will be able to do so across all subjects. It also has to be acknowledged that if a structure of assessment is applied to reflective writing then this may lead to students writing strategically (Pechone *et al* 2005).

The model in Figure 17 shows how the process of development in reflection took place on this course. Analysis of this kind on other courses together with consideration of the outcomes described in this section may well be useful as the basis for further research into the development of reflective thinking using e-portfolios, or any other medium as a pedagogical tool in ITT.

Finally, assessed work that requires trainee teachers to explore the views of children, or indeed, the influence that reflection has on the quality of student teaching may encourage a greater understanding, and, therefore, connection between theory and practice.

Chapter seven: Summary and Conclusion

7.1 Introduction

The research was carried out in order to better understand how an e-portfolio can be used as a pedagogical tool, the factors that influence its success and its potential to encourage reflective thinking among students training to be teachers. Data were collected through two studies over a two year period with two different cohorts. The argument is that the use of the e-portfolio as a pedagogical tool is multi-faceted and successful adoption is dependent on factors that are inter-connected. The results of this investigation in two cases studies in one institution cannot be generalised but do raise some points to be considered on other ITT courses adopting an e-portfolio as a pedagogical tool. Chapter one outlined the background to the study, chapter two the literature review of the current understanding of e-portfolios in education and in particular on ITT courses, chapter three the methodology, chapter four the analysis of year one, the pilot phase of the study, chapters five and six the findings resulting from the analyses of the data collected as part of the main study through questionnaires, interview and content analysis of reflective writing. This final chapter will bring together the findings of the research and outline implications for further study.

7.2 The major findings of this research

The rationale that underpinned this study was that exploration of the implementation of an e-portfolio would give a better understanding, and expand the body of knowledge of

how the use of the technology, as a pedagogical tool, can support reflective practice on an ITT course. As reported in the literature review, research on the construction of e-portfolios and use as repositories is abundant. However, research into their use as pedagogical tools to develop reflective practice is not comprehensive (Strudel & Wetzel 2008) and further research is needed (Steffans 2008). Close examination of the data collected through questionnaires, interviews and analysis of interactions on the e-portfolio, as well as analysis of work uploaded to the e-portfolio, enabled this current research to produce a rich picture based on the activities and perspectives of both tutors and students. From analysis of the data it was possible to understand how the e-portfolio was used by the tutors and students. What emerges is confirmatory evidence of previous research reported in the literature review with regards to issues that influence the successful implementation of an e-portfolio, for instance slow implementation, prior experience (Mason *et al* 2004; Strudler & Wetzel 2005; Gathercoal *et al* 2002), purpose and/or different purposes (Cotterill *et al* 2004b; Roberts *et al* 2005; Tosh *et al* 2005), technical support, management support (Wray 2007; Cotterill *et al* 2004b), technical capability (Young 2008), training and support for tutors/students (Green & Hannon 2007). In addition, a rich contextualised understanding of how the e-portfolio was used by trainee teachers for the purpose of recording reflection, and how this is supported by tutors has been elaborated. The key findings from the study addressing the research questions are presented below.

7.2.1 What are the key factors influencing the implementation of e-portfolios?

Skills and preferences

The skills and preferences of the cohort of students and tutors define the factors that influence the implementation. Prior knowledge and experience cannot be assumed. The two case studies reveal different profiles of student with regards to skill, confidence, preference and prior knowledge. If students do not have prior experience of e-portfolios or keeping reflective journals then it may be anticipated that the support they require during the implementation of an e-portfolio will be greater than those who have prior experience in these two areas (Strudler & Wetzel 2005; Gathercoal *et al* 2002). Additionally, if students prefer to keep paper copies then the advantages of digital storage need to be conveyed in order for students to take advantage of the possibilities the technology brings. In the main study the students reported being more confident users of technology than in the pilot but still reported a preference to keeping paper copies. This appeared to indicate a lack of confidence in the reliability of technology. There is a tension on courses where students are required to keep digital copies for one aspect of the course but paper copies for another aspect and this may cause confusion with regards to understanding course expectations. This aspect requires careful consideration by institutions in directing students to keep back-up digital copies rather than those in paper form, in order to promote the use of technology as a reliable storage facility. Although this could be seen as duplication of records, it is a duplication that is achieved quickly and efficiently and, therefore, adopted without seeing the process as doubling the workload and without the need for producing a hard copy, which is considered important (Lorenzo & Ittelson 2006).

Design of e-portfolio and course

The design of the work on the e-portfolio needs clear definition and the use as a pedagogical tool understood (Roberts *et al* 2005; Tosh *et al* 2005). The two different elements of the course suggested two different pedagogical uses of the e-portfolio and two different paradigms. 'Tasks' were activities to be completed following tutor guidance; there was a point of time in the course when they had to be carried out and handed in. 'Themes and Issues' required students to decide on how they would approach the work and when this would happen.

In this module the 'Tasks' which the students were required to complete could be interpreted as tutor-centred activities Students followed structured guidance on how and when to complete the 'Tasks' with clear deadlines. 'Tasks' were concrete activities to be completed in school and were directly related to classroom experience. Evidence of completion was uploaded into the e-portfolio.

The 'Themes and Issues' aspect of the course was conceptualised in a different way and maybe seen as a series of learner-centred activities. Students were expected to take responsibility for completing their reflective writing over the duration of the course, with weekly interactions on the e-portfolio. 'Themes and Issues' were abstract reflective writing activities to be completed in the training year, with the expectation that experience from all school placements would feed into the completion of this work. This expectation was not fulfilled, however. Students did not interact with this component of the course when in school. Their comments in interviews suggested they did not have the time to do so. Reflections were, therefore, carried out after the experience.

The amount of work expected through the e-portfolio was overwhelming for students in completion of activities and for tutors who were required to give feedback on these different elements. Although the workload was reduced in the pilot study when it was

realised that the expectations were not realistic, the workload was still perceived as too much and perpetuated by giving feedback with the expectation that the student would act on this feedback. For students this resulted in work that was never finished, and for tutors a potential circle of work requiring feedback. From the analysis of the feedback points this was occurring in June when the course was coming to an end, a time when both parties should have had closure on these activities. Giving fixed points in time for feedback does not give flexibility to the tutor in supporting the student and, therefore, it is questionable whether the student is being supported at the time when support is needed.

Shared understanding and purpose

Shared understanding and clarity of purpose are essential to the successful implementation (Tosh *et al* 2005; Cotterill *et al* 2004b; Roberts *et al* 2005; Peacock *et al* 2009). As was evident from the pilot, and to a lesser extent from the main study, there needs to be a shared understanding of the purpose for the adoption of the technology, together with clarity on the underpinning theory of leaning and associated pedagogy. If the e-portfolio is underpinned by socio-cultural and social constructivist theory then pedagogical approaches adopted by all tutors must be derived from this theory. This will be achieved by the support given to the student in constructing their knowledge and understanding through the interaction with the more informed other. This is seen as the appropriate adoption of pedagogy to support the social constructivist view of learning (Bates 2005). In the main study the students did not understand the purpose of the use of the e-portfolio as intended by the tutors. The students perceived the purpose of the e-portfolio as a repository for work and ease of access for tutors and not as a place to encourage reflection. This may account for the disappointing level of reflection reported by tutors or, alternatively, the method of assessment and associated issues as documented by Korthagen (1999), Spilkova (2001), and Richert (1992) and limited knowledge of how

to reflect as discussed by MacKinnon (1988). In addition the possibility of the school community taking on the role of the 'more informed other' for 'Themes and Issues' was removed by the fact that the students did not engage with this work whilst on placement and mentors' were unable to interact with the e-portfolio, even if they wanted to, due to limitations of the system.

As the 'Tasks' were completed whilst students were on school placement this implies that students did connect the work on the e-portfolio with that from the University. However, the interactions on the 'Themes and Issues' would seem to contradict this point. However, when considering the 'Tasks' as activities to be completed in school then these may have been viewed as the students' programme of what had to be achieved during school placement time, the students' response to instructions. Tutors' perception is that students see school placement as a priority over academic work, analysis of frequency and place of interactions would indicate that this is true for 'Themes and Issues' but not for 'Tasks'. Therefore, the decision the student makes on whether or not to complete work set by the University whilst on placement may be connected to relevance and precedence from the perspective of the student. The students reported confusion with regards to course expectations in the pilot, and to a lesser extent in the main study. This, as suggested earlier, may be due to the design of the e-portfolio but also the students' perceived relevance of the work and priority.

Training

Training for students and tutors needs to be on-going and based on the entry skills. From an initial audit of skills the tutors would be able to identify the level of training required by understanding the profile of the group. Initial and on-going training is desirable for both parties to see the full potential of using the e-portfolio. As can be seen from the outcome of the pilot lack of training was a contributing factor to the negative experience.

The main study was successful for the tutors due to their shared expert knowledge of the technology. The students also knew how to use the technology as it was part of the VLE they used for other aspects of University work. The technology being familiar to both tutors and students was a factor that contributed to the success of the implementation as well as the perception that the e-portfolio was an integral part of the technology used by the University. It is acknowledged that this may be a result of the e-portfolio being part of the University VLE. The implication of this that competence and confidence in using the technology are key factors for successful adoption; therefore, as stated in the literature, training is a fundamental aspect of the implementation process. The implication from the results of the main study goes further than this. Implementation problems can be overcome by users if the skills of the more informed other are in place.

In the main study tutors were perceived by the students as being the experts in the use of the e-portfolio, therefore issues with regards to support did not arise and the experience of using the e-portfolio was positive. This was a direct contrast to the pilot where tutor competence was seen as a major factor in students' dissatisfaction. However, in the main study students commented on the flaws in the design when they became more experienced in the use of the tool, and these were acknowledged by the tutors. The criticism made with regards to navigation and clarity of sections may be directly connected to the fact that the e-portfolio was designed using wikis and, therefore, limitations on the design functions available.

Pedagogical tool

If used as a pedagogical tool with social constructivism as the underlying theory of learning then it is assumed that the student's learning will be supported by social interaction with the 'more informed other'. By adopting different pedagogical approaches to the delivery of feedback in the main study, the tutors undermined the use of

the e-portfolio which in turn encouraged the students to use other means of interacting with the 'more informed other'. The result of this was the perception by some students that the level of support depended on the assigned tutor.

The use as a pedagogical tool anticipated that the students' ability to reflect would be supported by the feedback given by the tutors. This was perceived as a positive use by most students who valued the way in which some tutors commented throughout the work with the narrative of feedback to extend the boundaries of existing reflection. This could be interpreted as positive support by encouraging students to be 'dynamic participants' (Kimbell 2005). However, as this is assessed reflection it would have been helpful if the tutor referred to the requirements of the assessment criteria for Masters Level as well as level of reflection, so the students were aware of what they needed to do to improve the work. From interview data some students found the comments throughout the work to be helpful, whilst others saw this as a de-motivating factor as their interpretation was that the work was wrong.

7.2.2 How are e-portfolios used by trainee teachers?

Student interactions

Students used the e-portfolio in two different ways to complete the work. It is evident from the interactions that the students did not use the e-portfolio for reflection on 'Themes and Issues' whilst on placement, whereas they did interact with the e-portfolio for the completion of 'Tasks' whilst on placement, as discussed above. With regards to frequency of interactions, those students who worked hard on 'Tasks' also worked hard on 'Themes and Issues'. It was not possible to track the interactions of the students in the pilot over the duration of the course. This was achieved in the main study where the interactions of the students and tutors could be recorded. Students interacted more

frequently when a deadline for feedback was due, indicating that this was the motivating factor for interacting with the e-portfolio.

Method of working

Students chose to upload documents constructed using Microsoft Word to the e-portfolio, or used the on-line word processing tool to complete the work. The first method involving the upload of a file which the tutor would need to download in order to add feedback, the second method the tutor would be able to view the work on-line and make comments whilst in that view. These interactions increased during the later stages of the course when the final assessment was being made, again suggesting that the increased frequency was connected to the assessment point. Students did not necessarily use this feedback to improve the work, but may have used the comments to improve other work completed.

Tutors interactions

Tutors interacted with the e-portfolio during the feedback points; however, there was no consistency on the way feedback was given or the frequency of feedback on the e-portfolio. This was true for feedback from the course tutors but also from the specialist subject tutors who gave feedback on the mathematics and English sections on 'Tasks'. Tutors adopted different ways of recording the feedback on the work uploaded. Tutor interactions on 'Tasks' ranged from zero to eighteen. Tutor interactions on 'Themes and Issues' ranged from one to twelve. When considering individual tutors and the frequency of feedback points on 'Themes and Issues' to their students it is necessary to consider the mean score as some tutors had more students involved in the research. The range of these mean scores was from one interaction to eight. Twenty-nine of the 'Themes and Issues' selected by the students to work on at Masters Level did not receive feedback through the e-portfolio (Appendix 20). In the feedback tutors did not refer to the taxonomy included

in the course documentation, therefore students' attempts to improve the depth of writing relied solely on the feedback given.

Student interactions

The students used the e-portfolio to complete the 'Tasks' in a similar fashion, completing the work in school then uploading a document or used the e-portfolio to record their work. The work was completed during one interaction and not revisited. The number of student interactions on 'Tasks' ranged from thirty-four to two hundred and eight. 'Themes and Issues' were approached by students in different ways, as documented in chapter 6. Interactions with this section varied in frequency ranging from five to sixty-six. Those who interacted more frequently on 'Tasks' also did so on 'Themes and Issues' suggesting that the involvement of the student may be linked to intrinsic motivation rather than the extrinsic motivation from feedback.

Approach to reflective writing

The students approached the writing of 'Themes and Issues' in different ways, which suggests that the way in which they approached this writing resulted in the depth of reflection achieved.

Ownership

These case studies did not provide evidence that student ownership was a factor in successful implementation. Ownership in the pilot study was with the students but due to the skill level they did not always share assets with tutors, therefore feedback was not possible. In the main study students did not perceive ownership to be an issue. The e-portfolio was entirely for University assessed work. Therefore, the students did not understand why they should have ownership or why they would want to continue using the e-portfolio at the end of the course.

7.2.3 Is there a relationship between the use of e-portfolios and the development of reflective learners?

Purpose of reflection

The purpose of the reflection requires explanation, whether it is a record showing the 'journey', or the 'story' of the trainee teacher through the duration of the training, or a way of assessing academic achievement; this is determined, in part, by the assessment of such reflection. This is the dichotomy asking a student to reflect autonomously but then placing this reflection within a tutor imposed framework. For instance, if reflection is for the student to modify their practise to become more skilled in the art of teaching on an individual level, then the purpose of reflection would appear to be to improve their individual performance as a teacher, which is based on the context within which they are placed. Alternatively, if reflection is concerned with the student improving as assessed by an externally imposed framework, what the marking criteria perceives as the 'correct' way to reflect, then the improvement in depth of reflection moves from the individual context and the student's identity within that context, to a generalised assumption of what reflection looks like for all trainee teachers, this is the challenge for tutors (Pavolovich *et al* 2009).

Approach to reflection

In this current research the students who approached the completion of work on the e-portfolio where they documented their journey, not as a journal or diary which suggests a chronological sequence of events, but as a recording of the development of their thinking, achieved a greater depth of reflection. For instance, those students who shared a similar profile to case study three with regards to levels of 'Dialogic' and 'Critical' reflection recorded as in excess of twenty-seven per cent for the total of reflection, all approached

the work on the e-portfolio in a similar fashion. This would suggest that in order to achieve depth of reflection students should be encouraged to approach the work in a particular way by starting with the 'development of thinking' exploring what it is they know and understand as the stimulus for further investigation, in other words 'this is what I think about this' and then using experiences as a way of expanding this knowledge and understanding putting children at the centre of the process. The implication that those who reflect from a position where the children are the most important element of school experience may reflect at a deeper level. In contrast, those students who create a chronological narrative of reflective experiences or events from their perspective by keeping a journal or diary, (the implication that reflection changes over time and may be directly related to sequential experiences), with reference to their interpretation of literature read, may not have been the most effective strategy to encourage depth in reflection. This was the approach adopted by case study one.

Assessed reflection

The purpose of feedback in this study was to promote deeper reflection. Without reference to a framework of reflection students were unable to ascertain where they are and what they needed to do to move towards deeper reflection, guiding their development (Black & Plowright 2010). Therefore, tutors need to be clear on the framework of reflection adopted for assessment purposes so that the feedback supports the learner in moving towards deeper reflection. In addition if work is to be assessed, as was in this study, the framework for reflection needs to be mapped onto the marking criteria used. There is a distinct difference between the marking criteria adopted to determine level of academic achievement as in the case study and a hierarchical framework of reflection.

In order to evaluate the progress made over time an assessment of the starting point is necessary as well an assessment at the end point in order to determine the degree of

progress. Therefore, if assessment on academic ability to write at Masters Level is a requirement of the course, students should be aware of their assessed starting point in order to move towards a higher level of achievement. However, if assessment is related to level of reflection then equally the student should be aware of the starting point in order to improve along the continuum of reflection aiming at an increased depth. This is a dichotomy: whether the assessment is related to academic ability or ability to reflect, suggesting that these are two separate domains of expertise. If academic ability and depth of reflection are considered to be progressing along a similar continuum then it is assumed that the ability to reflect is directly related to the student's academic ability, as would seem to be the assumption in the design of the course in this current research. In short without a clear assessment framework students will not know what to aim for and tutors will not know how to assess, but the framework itself may constrain reflection as students may write for the tutor, knowing that this is an assessment rather than creating an authentic piece of personal reflection.

Consistency of feedback

Consistency of feedback by the tutors in supporting reflection to support the students in their acquisition of knowledge and understanding is required in order to scaffold the learning that is taking place. The effect of feedback in this research was the sense that work was never finished, with students encouraged to revisit work with a sense of no end point. This feedback, by its very nature, added to the workload of the students and tutors. Both tutors and students need closure, however, reflective activity is on-going. Inconsistency of feedback would also indicate to the students that their experience on a course is dependent on the pedagogical approach adopted by individual tutors.

Students perceived that the success of the e-portfolio was directly related to the assigned tutor and the pedagogical approaches the individual tutors adopted, as discussed earlier.

Students also reported that the e-portfolio did support their reflections, but were unable to articulate how this happened. This suggests that they do not necessarily see feedback as a pivotal aspect of the developing reflection but the act of placing work on the e-portfolio supporting reflection. This infers that by providing a space dedicated for reflection it will support reflection.

7.2.4 Do e-portfolios support continuing professional development?

For the pilot it was not the case that e-portfolios supported their continuing professional development. All students interviewed said they would not use it after the course had finished. This can be explained as the result of the experience they had had in using e-portfolios on the course. In the main study students said that they would not, even if given the opportunity to do so, use their e-portfolio after the course had finished as they did not see the relevance for continued use. This appears to be because they perceived the e-portfolio as a tool used for the course and not a useful personal repository. This is confirmed by their understanding of the purpose as being ease of access for tutors.

7.3 Strengths and limitations of the research

The aim of the research was to conduct two exploratory case studies to extend the boundaries of understanding of the use of e-portfolios as a pedagogical tool. Both strengths and limitations of the current research relate both to those commonly associated with case study as a research design, to the opportunities and constraints of the context where the case studies were conducted, and to the way in which the research was conducted.

Issues associated with case studies

As Yin (2009) suggests, the strength of case studies lie in their ability for an intense investigation into the case in question with a particular focus on questions of why and how. Generalizability is not the purpose although there may be aspects of case studies that apply in other contexts also. As Newby (2010) states what is useful about case studies is findings and implications that can be transferred to other situations or organisations, in this case, institutions of higher education or other institutions wishing to use e-portfolios. In the current research there is considerable learning that may be applicable elsewhere. The case study approach has enabled, in both studies, in-depth investigation of specific factors that have enabled and/or constrained the implementation of e-portfolios from the perspectives of the users in each aspect of the research. The interviews with tutors and students enabled an understanding of how and why the e-portfolio was adopted, and the way it was used by both user groups, to better understand their perception of the usefulness in achieving the course outcomes. It enabled exploration of the factors that supported integration of the e-portfolios into the pedagogy of the course, as well as those that constrained the effectiveness of the integration. It also enabled an in-depth understanding of what it was the pedagogy implied by the use of e-portfolios was designed to achieve, which is the development of reflective thinking.

The case studies employed a mixed method approach which in itself has both strengths and limitations. The different methods enabled an investigation of a wider range of aspects of the case study than would otherwise be possible. For example, the quantitative approach establishing the frequency of reflective occurrences to understand how many, and in which context the reflective thinking intended by the course designers actually took place. In particular it highlighted the fact that the reflection on activities in schools, and the link between theory and practice that was intended here was not happening whilst

students were on school placement. However, the quantitative approach of content analysis by key words/phrase cannot be claimed as objective as it had to be followed by the researchers' interpretation of how these key words/phrases could be grouped together into themes. As already discussed in the methodology, subjectivity in this case was addressed in discussion of thematic analysis with a member of the supervisory team. From the interviews different perspectives may have emerged representing different realities of truth.

Issues associated with context

Within the context of the case studies a number of opportunities for in-depth research and also constraints emerged. For instance, within the university the course leaders of an ITT course had taken a decision to use an e-portfolio for the first time and both students and tutors expressed their willingness to become involved in the research. Senior members of the faculty a well as senior members of the university were very keen for the research to be conducted. Over the duration of the research, and in particular the main study, the availability of willing course participants made it possible to carry out the detailed study of the perceptions of students and tutors, develop an understanding of how students interact with the e-portfolio and their response to the feedback given by the tutors. In addition, together with an analysis of written work enabled an understanding of context, frequency and depth of reflection taking place.

Observations of tutor training sessions followed by group discussions of what had been observed could have added a richness of understanding of the students/tutors' experiences prior to and during the course. Asking students' to maintain reflective diaries with contributions made as the course progressed may have also enabled further understanding of how and why they interacted with the e-portfolios in the way in which they did. However, lack of time and availability on the part of students and tutors made both of

these research techniques impracticable. Discussion with school based mentors associated with the degree to which they might be able to support trainees with the engagement of their e-portfolios may also have been useful. However, it has to be said that mentors are in a similar position to course tutors in that they have both a support and assessment role in relation to students' work on the course, and therefore, the same issues would apply as previously discussed with regards to tutors.

Issues associated with conduct of research

A number of issues associated with the way in which the research was conducted imposed some limitations on the breadth of its findings. These were associated with the number of study participants, the time and resources available for a part-time student to conduct research within the limited timeframe of the course itself, and the lack of access to students' material on the e-portfolios in the pilot study.

Further evaluation of a broader range of students' work as it relates to 'Themes and Issues', and the depth of reflection they achieved, might have enabled richer discussion of degree to which e-portfolios can be used as a pedagogical tool, especially in relation to tutor feedback. The inclusion of a greater number of students studying on the course would have enabled a higher degree of trustworthiness in the findings and the conclusions drawn from these.

Another issue is the lack of researcher time to investigate the extent to which tutors supported students' reflective writing, in ways that are not documented on the e-portfolios, is a limitation to understanding how tutors can support their students to become reflective learners. A fair assessment of the work of tutors in its totality was not, therefore, possible. However, this was not a limitation to understanding ways that e-portfolios can be used as a pedagogical tool as tutor interactions within the e-portfolios were analysed in the main study.

Overall the main constraint to addressing the research focus was the lack of students work on the e-portfolios at the end of the pilot study. This prevented both the analysis of frequency and depth of reflective occurrences, and also a comparison with the findings from the main study.

Amendments to the research

The three most important features of this research that might be amended to make it more focused and implications of the findings more trustworthy would be firstly increased sample size of students and tutors. Secondly, the focus would be narrowed to focus specifically on the aspect of e-portfolios that is related to reflective occurrences in order to enable a greater understanding of pedagogy that can support depth of reflection. Thirdly adopting personal reflective diaries as an additional research tool would enable data to be captured relating to changes in personal thinking over time.

7.4. Contribution

As stated in the introduction in chapter 1 and discussed further here, this research makes an important contribution to both the field of initial teacher education within a university context and the field of digital educational technology. In ITE the e-portfolios often have a dual role: evidence for meeting Standards and a means of supporting reflective thinking. The former has been extensively researched, the latter has not.

The thesis reports a study of the examination of the implementation process of a new e-portfolio and how this technology was used as a pedagogical tool to encourage trainee teachers in reflecting and developing their practice. The findings from the research regarding the implementation process follow closely the outcomes of previous research as documented, however, what emerges from this research is a detailed analysis of the use of the e-portfolio by the tutors and students as anticipated in the planning stage of the

research. This was achieved by investigating the perceptions of tutors and student using the technology, a detailed analysis of the frequency of tutor and students interactions identifying not only the timeline with regards to place in the course when these interactions occur, but also the context and comparison between the interactions on different elements of the course. In addition analysis of tutor feedback reveals the frequency of feedback on each element of the course and the student's response to this feedback. The analysis of reflection was anticipated in the early stages of the research; however, this analysis became a more significant part of the study revealing not only the place of reflective thinking but also the depth. What emerged was a detailed analysis of not only how the participants perceived the e-portfolio supported reflective practice, but also of student reflection identifying place and depth of reflection, changes over the duration of the course, response to feedback and how this influenced depth of reflection. Therefore, the research brought together three areas of the tutors and students experiences of using the e-portfolio as a pedagogical tool: firstly, how tutors and students interacted with the e-portfolio with regards to frequency, context, purpose and element of the course compared to the expectations of the course module guide; secondly, the role of the e-portfolio as a pedagogical tool facilitating the learning that was taking place, and thirdly, a detailed analysis of reflective writing.

Its originality lies in the way the in-depth case studies are able to lay bare issues as discussed below.

Course structure and content

What the study highlights is the importance of a strong rigorous clear conceptualisation of course structure and content that is well rooted in theoretical understandings of learning, which are compatible with the concept of reflective thinking and practice. This should lead to a clear shared purpose for the use of the e-portfolio which is understood by both

tutors and students. This cannot be assumed by course designers, and needs to be clearly understood by tutors who have the role of ensuring that students have a clear understanding. Failure to achieve this shared level of understanding may, as in the pilot study, lead to the adoption of different paradigms.

Depth of reflective thinking

It is important to consider how assessment of the depth of reflective thinking might be approached when reflective thinking and practice are, themselves, contested concepts that do not sit comfortably with a competency/skills based approach. This reflection is required as a skill to demonstrate that trainee teachers have met the Teachers' Standards, but the application of a static structure of assessment is problematic when applied to a dynamic process, particularly when this assessment attempts to measure both academic attainment and level of reflection. This implies a need for policy makers, both at national and local level, to understand and acknowledge that competencies and skills and different approaches may rest on different theoretical assumptions about views of mind and learning. This acknowledgement may require changes in policy as reflective thinking is not a competency but a dynamic process that changes with experience. As discussed in section 2.2, course designers are faced with three problems when structuring a course for training teachers. Firstly, there is the understanding of what constitutes teacher professionalism in the context of a training course and how this is conceptualised within course design. Secondly how the course design will meet the requirements of a competency-based process of assessing that a trainee teacher has met all the Standards, whilst also supporting the trainee teacher in the dynamic process of reflection thinking. Thirdly, making the decision of how the two elements of competency-based assessment, and the dynamic process of reflective thinking, are supported on a course with consideration of whether or not the e-portfolio is the most suitable tool to use. This

decision should be based on empirical research into the value of e-portfolios as pedagogical tools as well as repositories of artefacts and other evidence.

Assessed Reflection

The significance of sharing the problematic nature of assessing reflective thinking with colleagues and students alike is emphasised, and also sharing the resolution of the dilemma within the course structure, together with an understanding and acknowledgement of the points in the course at which the students' interacted on the e-portfolios, either through choice or necessity. This was particularly important in order to enable tutor support for formative feedback, and requires consideration in course design to ensure that assessment points recognise the points when students are able to interact with the e-portfolio. Therefore assessment points set need to consider the availability of tutor time, but also the context of the trainee teachers experience to enable a student to response.

Course tutors' understanding of reflective thinking

What was of particular importance was the degree to which tutors understood (or not) reflection in the context of this course, and how best to scaffold the learning through feedback which encouraged the student to reflect at a deeper level. This highlights the problems associated with assessing reflective thinking, which led to the production of a final paper rather than revealing the process, placing the importance on the product rather than the learning journey. In addition reflective thinking is dynamic. The process of giving formative feedback may, therefore, result in work that never seems to be complete and directly influences on tutor and student time in reviewing work.

Course tutor engagement with the e-portfolio

The issue of tutors understanding how to scaffold learning in the context of the course was associated with the extent of time requirements for tutors to engage with the dynamic, changing nature of students' thinking. The student needs with regards to support are difficult to predict in advance, result in individual students requiring support at differing times in the course which is problematic to achieve. The issue of how course designers conceptualise and respond to meeting the needs of all learners is problematic when dealing with people who require different levels of support at different times in the course, whilst responding to the requirements of policy both at national and local level. National level to ensure that compliance with regulations are met, and at a local level to comply with University expectations and accountability.

Training needs

Issues related to the importance of training of both tutors and students to use the technology as well as the conceptual understanding of how this could be used to support the development of reflective thinking were laid bare. The issues at the beginning of the course are the initial skills to use the technology, the understanding of how the technology supported the development of reflection, and, therefore how to exploit the potential of the technology. The training issues during the course are related to the developing training needs that emerge through using the technology in two aspects, firstly at a technical level and secondly development of the technology as a pedagogical tool.

Student voice

What is emphasised through the study is the importance of listening to the voice of those implementing the e-portfolio, the tutors, and additionally the voice of trainee teachers who use this technology; a group, as previously stated, commonly are not heard. Student

voice is important for two major reasons as explored briefly in chapter. Firstly there is the pragmatic issue of evaluating what they say. This is central given the assessment regime applied to all Providers of ITT where students, both past and present, contribute to the judgement on the quality of training offered. Therefore, when considering improving the quality of training it is important that Providers of ITT listen to the voice of the students.

Secondly there is the conceptual issue concerned with the model of learning, to ensure that the social constructivism model of learning which the students as trainee teachers are expected to use in the classroom is also applied to them as learners. During their training year trainee teachers are in the position of learning how to learn by understanding how, as educators, they can best support the children in the classroom. As this course has an underpinning assumption of socio cultural, constructivist theory, then this should permeate the whole course, demonstrating to students how the underpinning theory determines the way in which they teach. Part of this should be tutors listening to the students. This needs to be modelled very clearly in the feedback given and the way in which tutors deliberately try to understand the students current level of understanding so they can support them in further learning through the 'zone of proximal development' (Vygotsky 1978).

Shared pedagogical approach

Issues regarding the importance of a shared tutor pedagogical approach were uncovered. The problematic nature of adopting different pedagogical approaches led to some students receiving different levels of support than those identified in the module guide. By adopting different pedagogical approaches and not using the e-portfolio for feedback tutors give the impression that as tutors they did not see the value of the e-portfolio, as the tutor did not use the e-portfolio as intended. This raises issues regarding transparent

working procedures and accountability of tutors who are expected to provide feedback through the e-portfolio, the adoption of working practices that may encourage students to bypass the systems in place for feedback leading to the e-portfolio used to showcase final pieces of work and, therefore, seeming to make the e-portfolio redundant as a pedagogical tool and used alternatively as a repository for marked work.

Digital technology

The adoption of digital technology, in this research the e-portfolio, is explored and the problematic nature of embedding this technology university-wide revealed. This includes the reasons for the adoption and the perceptions of the individuals who are using the technology. The research uncovers the challenges of how technology can support teaching and learning, how tutors revert to previous methods of supporting students when the technology does not appear to offer an advantage, and how students find ways of bypassing technology if they discover faster ways of accessing tutor support. This is clearly linked to the pedagogical approaches adopted by tutors but is also concerned with the way in which the technology meets the needs of the course, how it is embedded throughout the curriculum and if it is perceived as having real value in the teaching and learning experience of both tutors and students.

7.5 Implications for ITE

This research focuses on the experience of the training provided in developing reflective practitioners in the training year and the role of digital technology within this process. Through the in-depth case studies issues are exposed relating to the dilemma of what constitutes reflective thinking and practice, assessment issues, and the policy at a local and national level with regards to the inspection regime of ITT Providers. In addition other issues relating to understanding of what constitutes professionalism and the need to

find an authentic place for competencies and reflective thinking, student voice to maintain the integrity of the model of learning and the adoption of digital technologies together with the implications for continuing professional development of teachers. ITT courses, such as the course researched, focus on the development of the student in becoming a highly skilled and reflective practitioner. What seems to be missing in course design is reference to the children and the quality of their learning in the classroom.

Reflection

How the depth of reflection is assumed to develop, and whether or not this is assessed, will be determined by how the course is designed. This raises issues concerned with the way reflection is conceptualised within a course, what reflection is in relation to the professionalism of a trainee teacher, and how this can be developed into their continuing professional development. A clear understanding by all tutors is required so that they are able to support the student in the process of reflection. This may be achieved not only listening to the student but also engaging in dialogue with feedback that supports the notion of reflection. By modelling this support to the student the student is more likely to be able to emulate this model of learning in the classroom. Students also need to have a clear understanding of the importance of reflection, why it is important and how their ability to reflect influences pupil progress.

When the structure of the course is designed there is also a need to consider the competencies within the Teachers' Standards (DfE 2012), which directly refer to reflection and how these will be demonstrated both as a competency and also a thread that runs throughout the course. This is embedded in the activities carried out by the students and also the way in which the tutors demonstrate the model of learning. Tutors need to demonstrate that they are supporting the learning and also listening to the students,

because by modelling this they are giving the students the skills and understanding to take with them into the classroom.

It is a widely held belief that trainee teachers improve their practice through the act of reflection, and the ability to reflect 'is a significant factor in promotion progress' (Children's Services and Skills 2010/11:77). In this annual report the Chief Inspector of Education goes on to comment that this is particularly the case in HEI-led partnerships where 'staff use their own research activity to promote critical thinking and link the development of subject knowledge with underpinning theory of how children learn', although the report goes on to criticise the degree to which this is achieved (Children's Services and Skills 2010/11:77). However, studies such as Butler et al (2004), McLellan (2006), Penso *et al* (2001) and Tillema (2006) suggest that teachers in their training year, and indeed as novice teachers, are unable to use reflection as a cyclical process of improvement. The implication of not reflecting on practice is that the individual will be less likely to develop his/her teaching skills and, therefore, will not be able to improve his/her practice. The consequence of this will be felt in the classroom, as discussed by Barber and Mourshed (2007). Student learning will be adversely affected if 'they *(pupils)* are not exposed to teachers of sufficient calibre' (2007:15) and OECD that 'the quality of an education system cannot exceed the quality of its teachers' (2011:235). During the research trainee teachers had thirty-three Standards to evidence against to demonstrate competency. The Standards have since changed and from September, 2012 all trainee teachers are required to meet eight Standards, two of which (Standards two and four) require evidence of reflection, and trainee teachers cannot be recommended for the award of QTS unless they can demonstrate they meet these Standards. A further Standard (Standard eight) requires trainees to 'take responsibility for improving teaching through appropriate professional development, responding to advice and feedback from colleagues' (DfE 2013: online) inferring that reflection is anticipated beyond the training

period. It should be noted that the Teachers' Standards do not just apply to the training year but are Standards that all teachers are required to meet throughout their careers. Therefore, it is very important that Providers of ITE ensure that their trainees have, through the training period, demonstrated how to reflect, and that they have confidence in the trainees' ability to incorporate this important element within their future practice. If reflection is not part of teachers continuing professional development then the implication is that they will not be compliant with the Standards and, therefore, will not develop into high quality teachers. The development of reflective practitioners may be achieved by ITE providers considering views of writers who suggest that classroom practitioners are best placed to support trainee teachers to become teachers (Hagger & McIntyre 2006) and that classroom based mentors are based placed to support trainee teachers in learning how to reflect (Ashby *et al* 2008), perhaps it would be prudent for Course Leaders to acknowledge this in course design. This could be achieved by using digital technology, such as an e-portfolio, to enable involvement of school practitioners, bringing together theory from university activities and practice from the classroom, promoting a community of practice between those involved in the training process. This would provide an opportunity for a closer partnership between classroom practitioners, academics and students together with encouraging dialogue as part of the training process enabling the co-construction of knowledge between these parties. This may also encourage students in acquiring the habit of reflection in the context of classroom practice with classroom practitioners, which may then be continued as the student embarks on their career as a teacher. E-portfolios have the capability to be used in this way.

Assessed Reflection

As previously discussed assessed reflection is problematic. Reflection is a personal reaction to a situation, based on prior experiences, personal philosophy, and emotional

responses which takes place at different times and in different ways according to the experience of the individual. Therefore, it would imply that something that happens at an individual personal level in the quest for professional development will be difficult to quantify for assessment.

In this research the assessed modules required students to carry out research on their own practice, and this can be a valuable record of critical reflection (Taber 2008). However, there appeared to be no consistency on how students used the e-portfolio, they were not used whilst students were on placement, and expectations with regards to frequency of use and feedback not met. Therefore, it would appear that the expectations of the module guide were not achievable for either the student or the tutor. This may have been avoided by the adoption of a workable framework of reflection to enable the students to identify their current level of reflection and what they needed to do to develop their ability to reflect. This is the dichotomy when reflection is assessed: is it assessed against an academic benchmark (in this case Masters Level work) or a hierarchy of levelled reflection? What needs to be very clear is the purpose for the reflection and how the assessment will be applied so that students can determine, through formative feedback, how they can improve. Analysis of student reflection, as described in chapter 6, would give tutors a clear understanding of the context for reflective thinking and the depth of reflection that is taking place. With a clear understanding of the context and depth of reflection tutors will be in a better position to support students in development the skill of reflective thinking.

Inspection of ITE

Providers of teacher training are held accountable in three areas, by the University for the academic progress of students, to the NCTL who allocate mainstream training places and are the awarding body of QTS, and the success of this training judged through the

OFSTED inspection regime. This is in a landscape where teaching training in England is changing with the introduction of diverse training routes and the move to creating closer working partnerships with schools.

The quality of training is determined by the outcome of the OFSTED inspection process when a judgement is made and only those Providers who receive a Grade 1 (outstanding) are guaranteed an allocation of mainstream places. This puts a great deal of pressure on university-based Providers who do not achieve Grade 1 and, therefore, faced with the prospect of losing places in future allocations, with the resulting problem of maintaining stability of staffing levels. In addition, the possible reduction in funding may adversely affect research opportunities within education departments (Christie, Donoghue, Kirk, McNamara, Menter, Moss, Noble-Rogers, Oancea, Rogers, Thomson, Whitty. 2012). As tutor research is seen as a factor in promoting good ITE provision (Children's Services and Skills 2010/11) , then it would seem that a reduction in Education Departments would have a detrimental effect on the training that is provided in ITE. In the inspection process OFSTED collate evidence from multiple perspectives. This includes,

- the views of current students who are interviewed during the inspection process and complete an online questionnaire commenting on their training provision
- the views of those teachers Providers of ITT have trained trained, who are in their first year of teaching, are asked for their views on the standard of the training they received
- the views of partnership schools used for placements during the training period and also those schools who employ teachers who have been trained by the Provider

In order to be judged an outstanding Provider they need to show that:

> 'Assessment of trainees is rigorous and precise. Consistently high-quality oral and written feedback and challenging developmental targets support trainees' critical reflections, enabling them to analyse, evaluate and improve their practice.'
>
> (OFSTED handbook 2013:36)

Therefore on a pragmatic level, it is imperative that Providers listen to and respond to student voice as their allocation of places may well be influenced by the perspectives of their current and past students.

On a conceptual level it is important that tutors listen to student voice, and ensure, as previously stated, that they model an effective approach of the more informed other who listens.

Competencies and reflection

ITE courses designers need to have a clear understanding of what constitutes professionalism in the context of teacher training as well as finding an authentic place for competencies and reflective thinking. As previous discussed there may be a dilemma when considering these two concepts which come from different theoretical foundations but compatibility may exist as suggested by Hackett (2001). If, as Hackett suggests, the training of teachers can be enriched by designing a course where meeting competencies and reflection can be brought together where 'reflection is grounded in real experience rather than remaining conceptual, and in which the meanings attributed to all facets of education, training and work are brought to awareness' (2001:111) the profession of teaching may well be enhanced.

Use of digital technology

The use of digital technology requires consideration in course design to exploit the potential of these technologies, and also to recognise and respond to the way in which students routinely use technology. In particular course design would benefit from

research into how students access information, particularly by the use of hand-held devices such as ‘smart’ phones, to ensure that information is placed in an area which is routinely accessed by students. This will ensure that students view important information and that they understand the course expectations. With regards to completion of aspects of the course on the e-portfolio, the design would benefit from consideration of student and tutor experience by addressing issues of navigation and how the process of feedback is accomplished. Therefore, when conceptualising course design there is a requirement of exploring the purpose of the e-portfolio on each individual course in order to enable the e-portfolio to support the process of students achieving course outcomes.

The outcomes of this research point to how the implementation process of digital technology may be enhanced through the training provided in two aspects. Firstly, this involves the training of tutors and students in using the technology, and secondly how to use the digital technology to support the learning process. For tutors, this second aspect of training involves the adoption of digital technology as an appropriate pedagogical tool to enable the development of students, this case to support reflection. For students, the second aspect of training to understand the purpose of the e-portfolio and the requirements of the course together with a clear understanding of and expectations of the tutors.

There were discrepancies between the students in the occurrences of interactions, the way they used the e-portfolio and the occurrences of feedback as discussed in chapter 5. This has implications for equality of training, particularly the equality of support provided by the individual tutors and their accountability with regards to their role, as defined by the module guide, in a climate of increasing student fees. This is particular salient given the inspection regime discussed above.

The difficulties encountered in the adoption of the e-portfolio in the pilot appeared to be caused by the tutors not understanding how to use the technology or how this would support the learning process. However, in the main study when tutors had the necessary skills to use the technology, the difficulties of assessing reflection on the e-portfolio became apparent (chapter 6). These are issues that may well need to be addressed by universities in generic training as well training on course design. Course design is specifically important in this case where the purpose was to support students whilst on campus and also when on placement and therefore may be perceived as distance learners. The consideration of student context would highlight the times during the course when students are more likely to engage with the e-portfolio. In future, tutors may wish to reflect on whether or not the setting of assessed assignments, as in this case, is the best way for students to demonstrate their development as reflective practitioners.

Continuing Professional Development

As suggested by Villegas-Reimers 'the development of teachers is a lifelong process which begins with the initial preparation that teachers receive and continues until retirement' (2003:8). Continuing professional development is important and as recently reported by BERA those who experience high quality training will strive to develop their practices in their careers (BERA 2013). If the purpose of teacher training is to encourage reflection, and for trainees to adopt the habit of reflection to take forward in their teaching career, and discussed above, then I would suggest that institutions may need to consider this in the development of courses designed using e-portfolios as a pedagogical tool to support reflective thinking. It is widely acknowledged that reflection is important (see section 2.7), and indeed not just part of the teachers domain but also a skill that teachers strive to develop in their students approach to work. Teachers are required to deliver the requirements of the National Curriculum (1998), particularly in the development of the

skill of problem solving, therefore is imperative that during the training period trainee teachers understand the process of reflection and how to support this dynamic process so they are able to support the learners they will be teaching. However, this course did not acknowledge that by developing reflective thinking skills trainee teachers would be in a position of supporting the children in their class to develop similar skills. The way in which the course was designed focused on trainee teachers developing reflective thinking for the purpose of assessment against academic criteria. What appears to be missing is the connection between the act of reflection and the outcome this has on practice, and how this influences the children in the classroom. This may be achieved by designing the course so that trainee teachers are required not only to reflect but document the consequences of that reflection with regards to children's learning, demonstrating the impact of this on children's progress. Although the course did require the trainee teachers to provide an example from the classroom to show that they were able to make the connection between theory and practice, this led to a description from experience rather than an analysis of the outcome. Therefore, what seemed to be missing was an acknowledgement of the reason for the act of reflection by exploring the outcome of that reflection, which would have created opportunities for trainee teachers to develop an understanding of how influential reflection is in their continuing professional development.

If during the training year ITT Providers viewed teaching as a continuum from training and beyond, and that the skill of reflection was part of this continuum, then it may be possible to design courses that enable trainee teachers to see how reflection is an integral part of their practice. As suggested by Musset (2010) this should include formal and informal opportunities that have an influence on how they teach and what they need to learn to teach, the skill of reflection is part of this process.

In this research the students in the Pilot stated they would not use the e-portfolio after the training and in the Main study the opportunity to use the e-portfolio was not available. However, it is not an issue of whether or not the trainee teachers have access to their University e-portfolio after graduation, but of the skills and habits they have developed through the experience of using the e-portfolio as a pedagogical tool. The importance here is whether the e-portfolio enhances the skills of trainee teachers in using technology as suggested by Young (2008) and, in addition, they see the benefits of using this technology for recording reflections. These may both be transferrable skills for the classroom. However, this will only be achieved if trainee teachers are able to identify the elements of their training which can be incorporated in their teaching and learning. This would suggest that in the training year the reasons for using digital technology to enhance learning need to be explicit so that the students, the trainee teachers, understand how digital technology can be exploited in the classroom. This requires a clear understanding of the underpinning theory, the process of developing reflective thinking through the externalisation of thinking and the role of dialogue with the more informed other and purpose of feedback.

Given that reflective thinking has been highlighted as an important issue to be considered in the long-term development of teachers it is equally as important to consider whether e-portfolios have a role in supporting reflection as seems to be widely claimed, for example Cotterill *et al* (2004). Therefore, further research into how e-portfolios support reflective thinking needs to be carried out to see if the claims made about the potential for e-portfolios in supporting reflective thinking can be demonstrated in practice, as this is particularly important in teachers' continuing professional development.

7.6 Implications for further research

As this research investigated two case studies it is not possible to generalise the findings as they are unique to the context. However, the findings do suggest that further research on students and tutors perception of ownership, on the way in which students interact with the e-portfolio and analysis of their work on the e-portfolio, for depth and context for reflection, may help to better understand the complex nature of how e-portfolios can be used as a pedagogical tool.

It is suggested that further research investigating the development of reflective thinking in work completed using an e-portfolio will help to better understand the factors that may influence the depth of reflection taking place. For instance whether the different contexts of teacher training encourage students to interact with different aspects of the expectations of the course, if so, then the role of the tutor in supporting the learning may differ according to the context. This may also influence the design of the course. If the context in which the student is working has an influence on the course work they complete, as suggested in this research, this will also have an influence on how and when the reflections take place. Further research may determine the motivating factors for the reflection and whether or not the development of the reflection is connected to the assessment that is taking place, when the depth of reflection is achieved and where this is located to better understand the contextual nature of when and how this occurs. The model of reflection explained in section 6.4 (Figure 16), may provide a framework for understanding the 'Development of Thinking' where it is suggested that there is an elaboration of the students' understanding of both theory and practice. This model of cycle of reflection may well be useful as the basis for further research into the development of reflective thinking using e-portfolios or any other medium as a pedagogical tool.

7.7 Conclusion

This research sought to investigate the complex nature of the introduction of an e-portfolio, on a one-year course of ITT over a two-year period. The case study findings show that the two cohorts of students and course tutors, (tutors who remained constant over the two years) had different experiences using PebblePad and the bespoke e-portfolio. However, it was not the case that one e-portfolio was better than the other, as the research suggests both systems had negative as well as positive attributes, although the pilot was perceived as a negative experience by both the tutors and students. The results of the research appear to imply that the successful implementation of an e-portfolio is not necessarily about the tool, although this is a contributing factor, but is concerned with the pedagogical approach together with the underpinning theory adopted by the tutors, and understood by the students. There are two different sets of skills to be acquired. The first relates to use of the technology. The second, for tutors, relates to ways of supporting students' reflective thinking; for students it relates to how to produce text that evidences reflective thinking. Failure to adopt the e-portfolio as a pedagogical tool that reflects the underpinning theory of learning leads to confusion and, in this study, resulted in confusion with students and tutors adopted differing paradigms in attempting to achieve clarity.

By adopting a bespoke e-portfolio in the second year the tutors resolved the factors that led to the discontinued use of PebblePad. The tutors had the skills and knowledge to operate the bespoke system, were in control of the design and were confident in the support of the University technical staff as the bespoke e-portfolio was part of the University VLE. This system gave access to students work to the tutors without the need for students' permission.

What is interesting from the main study is the way in which the students interacted with the e-portfolio in both the frequency and context for that interaction. Of particular concern is the lack of interaction on the e-portfolios in relation to 'Themes and Issues' during school placements, at the very time when the course expectation was that they would be integrating theory into practice. Acknowledgement of frequency and context in the design of the course would enable its features to mirror the likely activities of the student, aligning the expectations closely with what is possible from the students' perspective.

The analysis in chapter six explored the evidence of students' reflective thinking in their e-portfolio. This chapter indicates that students approached the work in different ways, and approached 'Themes and Issues' differently and as a result were successful in achieving a depth of reflection in varying degrees. Paradoxically, although reflective thinking is development and non linear, in students may go through iterative processes of thinking, it may be necessary to support their development with a clear structured framework, such as Hatton and Smith.

It is clear from this research that tutor skills in using the e-portfolio tool are pivotal in the successful implementation, together with a clear design with transparent course expectations and theoretical underpinnings, which will assist in the promotion of a shared understanding of purpose. Tutors and students are then more likely to understand their roles in the process of e-portfolio construction. The process and product of the e-portfolio can then be assessed against a mutually understood framework. Feedback that is linked to a clear framework will allow the student to improve depth of reflection that is closely related to an understanding of how depth of reflection is to be achieved. With these elements in place the intended outcomes of using the e-portfolio as a pedagogical tool is more likely to be successful.

The above seeks to clarify the implications for ITE from this research. The research did not seek to explore the political agenda with regards to education in England, nor explore the issue of whether trainee teachers should be studying at Masters level during the initial training year. However, the research is framed within the requirements of teacher education and how one course responded to the development of reflective practitioners.

This research has documented the experiences of a group of students and tutors, enabling a clearer understanding of the implementation of digital technology, and has also uncovered the complex nature of training teachers to become reflective practitioners. In addition it has uncovered the background story of my interest and knowledge acquisition as the research has evolved. As stated in chapter 1 the originality of the thesis lies in the examination of the implementation process of a new e-portfolio and how this technology was used as a pedagogical tool to encourage trainee teachers in reflecting and developing their practice. What emerges through the research is confirmatory evidence of previous research together with a rich contextualised understanding of how the technology was utilised by trainee teachers and tutors. This research gives a voice to those implementing the e-portfolio, the tutors, and in addition a voice to the trainee teachers who used this technology. The development of reflection through the use of the e-portfolio is analysed in detail contributing to the body of knowledge with regards to how trainee teachers reflect in order to improve their practice and the role of the e-portfolio in supporting this development. Therefore, this research makes an important contribution to both the field of initial teacher education within a university context and the field of digital educational technology.

On a personal level the process of carrying out this research has enriched my understanding of the process of implementing digital technology as perceived by students and tutors. In addition, it has uncovered the background story of these participants as

they strive to develop their skills and understanding through the process of learning how to learn. The experience of my journey as researcher has led me to understand that it is not only about describing or reporting on the process, but also the development of self-awareness of my role within the research by standing back. It is this critical examination of my position within the research process that has enabled me to question my own personal beliefs, values and philosophy enhancing my continuing professional development.

Appendix 1 – Consent information letter and consent form

Dear

As part of my PhD studies I am investigating the use of e-Portfolios in Initial Teacher Training. The main objectives of this research will be to investigate the factors that impact the implementation process of e-portfolios such as:-

- how e-portfolios are used to support trainees in evidencing pedagogic and professional competency against the QTS standards
- the relationship between the use of e-portfolio and the development of reflective learning
- the impact that e-portfolios have in supporting continual professional development

The issues to be investigated initially are concerned with the implementation of e-portfolios and how this influences the learning and assessment within the teacher training process. At this stage of the research these issues are likely to include such things as technical training, support, user motivation, accessibility, assessment, and tutor/learner perceptions in terms of how the use of e-portfolios is influencing their professional development. The results of the study will subsequently outline some of the key factors that e-portfolio implementation has on the teacher training process as well as its impact on the learner. It is also anticipated that a longitudinal study will be undertaken that will investigate the influence of e-portfolios on the development of reflective learners and continual professional development.

All the information that I collect will be kept confidential and will not be passed on to any third party in a form that you will be able to be identified.

It is perfectly acceptable for you not to participate or to stop at any point during the study. Your participation or non-participation in this study will not have any consequence on your status within the University. Furthermore, your participation in this study is not in response to financial or other inducements.

At your request, I will also make my findings available to you when I am finished with my study. If you require any further information please contact me at jeanette.mills@.....ac.uk or contact my Supervisor Dr Pat Jefferies at pat.jefferies@.....ac.uk.

Yours faithfully,

E-portfolios in Initial Teacher Training - Consent Form

Material gathered during this research will be treated as confidential and securely stored. Please answer each statement concerning the collection and use of the research data.

Statement	Yes	No
I have read and understood the information letter		
I have been given the opportunity to ask questions about the study		

I have had my questions answered satisfactorily		
I consent to sharing my reflective journal		
I consent to the reflective journal entries being used as part of this research		
I agree to being interviewed		
I agree to having the interview audio taped		
I would like to see a copy of my transcript		
I would like my name acknowledged in the report (without linking it to content or quotation)		

Name (printed) _____

Signature _____ Date_____

Please feel free to contact me if you have any further questions.
The name of the main investigator, along with telephone and email contact details is:
Name: Jeanette Mills
(name and address of research university)
Tel: Mobile
Email: jeanette.mills@.....ac.uk

Appendix 2 – Pilot phase and Main Study initial student questionnaire

Questionnaire e-Portfolio Research
I would be grateful if you would complete this questionnaire comprising of six questions by circling the number or word that best describes your situation. Below each question is a box for any comment you would like to add. All responses will be treated confidentially and used only to inform the research, anonymity of participants will be maintained throughout the study. Thank you for your help in this matter.

Jeanette Mills

PhD Student
Email address: Jeanette.mills@.....ac.uk

1. How confident do you feel in using a computer? low 1 2 3 4 5 6 high
Comment
2. How anxious do you feel when presented with computer programs you have never met before? low 1 2 3 4 5 6 high
Comment:
3. Have you used an e-portfolio before? Yes/No
Comment:
4. Do you prefer to keep paper copies or electronic copies of important documents and records? Paper/Electronic
Comment:
5. Have you been asked to keep a reflective journal/diary in any other institution? Yes/No
Comment:
6. How frequently do you choose to use email or a social networking site? (please tick all relevant boxes)

	Everyday	*Weekly*	*Fortnightly*	*Hardly Ever*	*Never*
Email					
Social Networking Site					

Comment:

Thank you for completing this questionnaire. If you feel you would like to help me in this research further please complete the following:-

I agree to being interviewed Yes/No

I am willing to complete a further questionnaire Yes/No

If you have answered yes to either statement please provide me with an email address I may use to contact you.

Email Address: ……

Amendments to questionnaire for Main Study:

Additional of question 7 'Do you know why the e-portfolio is being introduced on this course?'

Appendix 3 – Student second questionnaire

I would be grateful if you would complete this questionnaire comprising of seven questions by highlighting the number or word that best describes your situation. Below each question is a box for any comment you would like to add. All responses will be treated confidentially and used only to inform the research, anonymity of participants will be maintained throughout the study. Thank you for your help in this matter.

Jeanette Mills (jeanette.mills@.....ac.uk)

Question	Answer
1. How many times have you received feedback on work uploaded to PebblePad?	None/one/two/three/four/more than four
Comment:	
2. How did you receive the feedback?	Through PebblePad/Email/Face to Face/Other
Comment:	
3. Do you think you have the IT skills to use PebblePad?	Yes/No
Comment:	
4. Do you have access to technical support on how to use PebblePad?	Yes/No (if yes please specify)
Comment:	
5. How many hours do you spend on PebblePad each week?	Hours per week = Whilst in University/Placement/Both
Comment:	
6. Now you have used PebblePad, do you understand why it is being used on this course?	Yes/No
Comment:	
7. Would you like more training?	Yes/No
Comment	

Thank you for completing this questionnaire.

Appendix 4 – Tutor Questionnaire

Questionnaire e-Portfolio Research

I would be grateful if you would complete and return this questionnaire comprising of seven questions via PebblePad or email (jeanette.mills@beds.ac.uk). I would like to carry out interviews with a sample of staff before the beginning of the next academic year and the following will inform the selection process. Thank you for your help in this matter.

Jeanette Mills

8th July, 2009

Name:
1. How would you describe your computer skills?
2. How do you feel when presented with new technologies?
3. Have you used an e-portfolio before?
4. How would you describe your training needs?
5. Do you know why the e-portfolio is being introduced on this course?
6. How will using the e-portfolio help your students learn?
7. How do you see e-portfolios helping you to teach?

Appendix 5. Justification for questions

How would you describe your computer skills? /How confident do you feel in using a computer?

This question was designed to allow the participants to self-report on their skill level. It is clear that those individuals who are more ICT aware are those who will be more successful in the use of e-portfolios (Krasna *et al* 2007; Wray 2007). This gave an indication of the perceived skill level, although it is acknowledged that self-reporting can lead to a mismatch between perceived skills and actual skills. Research has shown that trainees with low skill levels will be disadvantaged by using ICT and it can be inferred that this assumption would apply similarly for the tutor. It is also concluded in research that students who engage in using e-portfolios often need significant support and if tutors do not have a good level of understanding then they will not be able to support the students (Bartlett & Sherry 2006; Woodward & Hanoly 2004). The underpinning social constructivist theory that tutors being the experts (the more informed other) will scaffold the learning of the students will not be possible if the skill level of the tutor is not sufficient to use the technology effectively. As a pedagogical tool the e-portfolio is a repository for the student and it is the support from the tutor in guiding the reflective practice that is of utmost importance, as such they are required to have the skills to use the e-portfolio to achieve this purpose.

How do you feel when presented with new technologies? /How anxious do you feel when presented with computer programs you have never met before?

Research implies that anxiety does affect an individual's ability to learn, and that if they are feeling anxious about learning how to use the e-portfolio the implication is that they will find the learning process more difficult. Those reluctant to use new technologies because of their lack of confidence may also be those who are less committed to use technology due to their level of anxiety (Higgison *et al* 2006).

Have you used an e-portfolio before?

This question is closely linked to the previous question. Previous knowledge of this technology will give confidence and knowledge to begin using the technology. Prior knowledge is identified in recent research as being fundamental in the successful use of e-portfolios (Barrett 2007; Studler & Wetzel 2005)

How would you describe your training needs?

By self-reporting their training needs the researcher was able to gauge the level of training the participant believed was necessary and compare this with the actual level of training given. This comparison will provide information on whether or not the participant perceived the training they received was adequate. It is by providing adequate training to meet both the actual needs and perceived needs of the individual that is imperative to the success of the technology (Young & Lipczynski 2007). Cohen (2005) goes further by suggesting that individuals will need constant training as well as technical support, McNair and Galanouli (2002) also emphasize the need to constantly improve

skills. However, it is this level of support that is often missing in large institutions due to the logistics of providing individualised training and the level of technical support needed on a twenty-four hour seven day a week basis. It is not unreasonable to suggest that successful implementation depends on the training given (Roblyer & Knezek 2003; Barlett & Sherry 2006).

Do you know why the e-portfolio is being introduced on this course?

Responses to this question provided information on how tutors and students perceive the introduction of the e-portfolio. To be successful there needs to be clarity of purpose (Cotterill *et al* 2004). A shared purpose and shared vision for the introduction of this technology and an understanding by all involved of the benefits this will provide is imperative, as the commitment of tutor will affect the outcome (Higgison *et al* 2006; Murray & Smith 2006; Wilhelm, Puckett, Beisser, Wilshart, Meredith & Sivakumaran 2007). Mee (2008) implies that the needs of all the stakeholders will have to be addressed. Together with clarity of purpose the way in which the e-portfolio is embedded within the whole course will impact on the success. Institutions who have introduced e-portfolios holistically with a large scale implementation across the campus have found success as have those who have realised the importance of embedding the e-portfolio within the whole of the course (Henry 2001; Wetzel & Strudler 2006; Lipczynski & Young 2007). This question was omitted from the student questionnaire in the pilot, but was included in the main study student questionnaire.

How will using the e-portfolio help your students learn? and How do you see e-portfolios helping you to teach?

Responses provided information on the tutors' perception on the way e-portfolios will assist in the teaching and learning process, regardless of whether they perceive there will be any benefits for themselves and/or their students. Learning and teaching styles do impact on the way in which users engage with e-portfolios (Willis, Gravestock & Jenkins 2006; Heaton-Shrestha, Gibbs, Edirisingha & Lindley 2007). This did, with further investigation during tutor interviews, provide valuable data about how tutors perceive learning is constructed from both synchronously and asynchronously interactions with the e-portfolio. Feedback is a crucial element in the motivation of use for students to be motivated to use the reflective journals and improve reflection (Alterio 2004). It is whether or not the tutor can see themselves able to give the level of feedback that their students may require and the urgency that online correspondence can tend to demand is questionable. With an e-portfolio it is possible for group responses to be shared and common issues to be addressed; therefore, to some extent the concerns over time can be alleviated.

Do you prefer to keep paper copies or electronic copies of important documents and records? (student questionnaire)

Preference for paper copies may indicate a duplication of records, the preference for electronic copies may indicate the student's acceptance of technology as a means of storage suggesting a level of competence and confidence in storing data in this way. As highlighted by Young (2008), those who are skilled users of technology may have an

advantage when working with e-portfolios. This view is endorsed by Krasna *et al* (2007) who see ICT capability as a key aspect in the success of e-portfolios.

Have you been asked to keep a reflective journal/diary in any other institution?

Familiarity with paper-based or electronic portfolios is one factor that influences the implementation process, and may contribute to the successful implementation (Strudler & Wetzel 2005; Gathercoal *et al* 2002). Therefore, prior experience of keeping a reflective journal, either in paper or digital form, may give the student an advantage on the course. Previous knowledge of compiling a journal may give the student confidence in their ability to achieve these aspects of the course.

How frequently do you choose to use email or a social networking site?

This gives an indication on the extent to which the student has embraced technology in their everyday lives and has used this as a means of communicating with the wider community. Acceptance of this form of communication would indicate that the student would be able to converse remotely by synchronous and asynchronous means. Those who have grown up during the digital age, and for whom the use of technology has been normalised, are more likely to embrace this approach to learning (Green & Hannon 2007).

Appendix 6. Pilot phase and main study student interview schedule

Pilot students - first interview
1. Have you used Pebblepad since the last time we met (September 2009)? 2. Do you feel you have the skills to use PebblePad? 3. How is PebblePad supporting your reflection? 4. Do you discuss the work on Pebblepad when you meet with your tutor? 5. How much time do you spend on PebblePad each week? 6. Do you know why you are using the e-portfolio? 7. Have you received feedback through the PebblePad? 8. What is the motivation for using PebblePad? 9. Have you experienced any technical issues with using PebblePad?
Pilot students - second interview
1. Have you used Pebblepad whilst on placement? 2. What have you uploaded to Pebblepad so far? 3. Talk me through the process of uploaded work 4. Have you received any feedback through PebblePad? 5. How much time are you spending on PebblePad each week? 6. Have the technical issues we discussed been rectified? 7. Do you understand the course expectations? 8. How does PebblePad support you are a reflective practitioner? 9. Do you prefer to keep paper or digital copies of documents?
Pilot students - third interview
1. Have you received feedback through Pebblepad since we last met? 2. What do you feel are the main advantages and disadvantages of using PebblePad? 3. Will you be using Pebblepad after the end of the course?
Main study students – first interview
1. Have you used an e-portfolio before? 2. Do you feel you have the skills to use the e-portfolio? 3. Have you received sufficient training in using the e-portfolio as a tool and for the work you are expected to carry out on the e-portfolio? 4. Do you know why you are being asked to keep an e-portfolio? 5. Have you encountered any technical problems using the e-portfolio? 6. Have you received any feedback through the e-portfolio? 7. How useful was the feedback in supporting your reflective writing? 8. Is your tutor able to support you if you need help with the technical aspects of the e-portfolio as well as the course expectations? 9. Other than your tutor who else can you ask for help in using the e-portfolio? 10. Is your school mentor able to access the e-portfolio? 11. How would you describe your experience of using the e-portfolio so far?
Main study student s- second interview
1. How are you getting on with the work on the e-portfolio?

2. Have you received feedback through the e-portfolio?
3. Tell me how the e-portfolio is supporting your reflective writing?
4. Do you feel that the e-portfolio is underpinned by social constructivism?
5. Have you experienced any issues using the e-portfolio?
6. Do you feel well supported?
7. Will you be able to use the e-portfolio at the end of the course?
8. Do you use the e-portfolio when you are in school?
9. Is the e-portfolio supporting you in your reflective writing?

Main study students – third interview

1. Tell me about the experience you have had using the e-portfolio?
2. If you have had technical issues how quickly were they resolved?
3. Do you feel the year using the e-portfolio has been a positive experience?
4. Have you used the word processor on the e-portfolio to produce the work?
5. How many times have you received feedback?
6. How has the feedback supported your reflective writing?
7. Has your tutor supported your ability to reflect through the e-portfolio?
8. What are the main advantages and disadvantages of using this e-portfolio?
9. Is there anything you would have liked to be able to do on the e-portfolio but have not been able to?
10. Other than your tutor have you shared your work with anyone else?

Appendix 7. Pilot phase and main study tutor interview schedule

Tutors pilot – first interview
1. How are you finding using PebblePad as a tool to support reflective practice? 2. What tools do you use? 3. When do you talk to your students about using PebblePad? 4. How much time do you spend on PebblePad? 5. What do you do when you are using PebblePad? 6. How are you assessing the students' work? 7. Are students motivated by the feedback? 8. Have you experienced any issues with the implementation process?
Tutors pilot – second interview
1. How do students share their work with you? 2. Can you explain the experience of giving feedback through PebblePad? 3. What tools do you use to give feedback? 4. How much time do you spend assessing work on PebblePad? 5. Tell me about the level of reflection the students are achieving on PebblePad? 5. Have you encountered any technical issues? 6. Do your students know the purpose for using PebblePad? 7. Do you and your students have the skills to use PebblePad?
Tutors pilot – third interview
1. Have the technical issues we discussed been resolved? 2. Have the student understood the course expectations? 3. Would you like to comment on the relationship you have with students through PebblePad? 4. How would you sum up the experience of using PebblePad? 5. Why have you decided not to use PebblePad next year?
Tutors main – first interview
1. Do you know why you have changed e-portfolio platforms for this year? 2. Who has designed the e-portfolio? 3. Have you had training? 4. What support do you have in place? 5. Do you feel confident using the e-portfolio? 6. Have you given the students feedback through the e-portfolio? 7. How have you given feedback? 8. If you could change any part of the design what would it be?
Tutors main – second interview
1. How are your students interacting with the e-portfolio? 2. Are the students achieving the level of reflection you are expecting? 3. Are there any technical issues? 4. Are the students making the connection between the different elements of the course? 5. Do you talk with the students about the e-portfolio when they are in university? 6. With regards purpose, are the students aware of the purpose? 7. Are there exemplars of work on the e-portfolio? 8. Have you given the students feedback since we last met?
Tutors main – third interview
1. Are the students achieving the level of reflection you anticipated?

2. Do the students understand course expectations?
3. Tell me about the pedagogy you have adopted in using the e-portfolio?
4. Is the work on the e-portfolio purely for assessment purposes?
5. Are the students making the connection between the different elements of the course?
6. How many times have you given feedback to the students and how was this given means?
7. Are you happy to use the e-portfolio for the reflective practitioner module?
8. Tell me about your experience of using the e-portfolio this year?

Appendix 8. Reflective Journal Assessment Reflection Taxonomy from Course Module Guide

Level of study	Reflective Stage	Characteristics
1	Initiate/ Reporting/ Technical	Anecdotal description of personal learning activities or observations. describes, reports or retells with minimal/hardly any changes to original ideas, no added observations or insights. Reports event or literature, not reflective at all.
1 2	Novice/ Responding/ Descriptive	Considered observations in the light of personal experience or feelings. Uses sources in some way with a few changes to original ideas or concepts. Makes an observation or judgement without making any further inferences or detailing the reasons for judgement. Asks rhetorical questions without attempting to answer it or consider alternatives. Reports a feeling such as relief, anxiety, happiness etc. Demonstrate changes in learning and demonstrate some ability to structure thoughts. Comparisons against criteria.
2	Emergent/ Relating/ Dialogic	Rationalising and adapting observations in the light of personal or vicarious experiences. Identifies aspects of the information which have personal meaning or which connect with their prior or current experience. Recognises relationships between ideas. Identifies something they are good at, something they need to improve, a mistake they have made, or an area in which they have learnt from their practical experience. Attempts to provide reasons, based on personal judgement or reading of literature. A form of discourse with one's self, an exploration of possible reasons. Selection of relevant material to make meaning of learning. Demonstrates resilience through self analysis. Identify own problem solving techniques. Analysis with some guidance.
2	Adaptive/ Reasoning/ Critical	Providing rationale for observations or actions on the basis of past experience, theory and philosophy. Evidence of emergent meta-cognitive practice. Integrating the information into an appropriate relationship, eg with theoretical concepts, personal experience, involving transformation and conceptualisation. Explores or analyses a concept, event or experience, asks

3		questions and looks for answers, considers alternatives or hypothesises about why something has happened. Explore the relationship between theory and practice in some depth. Clear evidence of critical judgement in selecting, ordering and analysing content to make meaning. Evidence of relationship interaction with peers and tutor resulting in collaborative working.
3 M	Autonomous/ Reconstructing	Extensive reading and researching. Independently applying personal knowledge and experience to unknown situations, taking into account cultural, social, political and ethical phenomena. Displays a high level of abstract thinking to generalise and/or apply learning. Draws an original conclusion from their reflections, generalises from their experiences, extracts general principles, formulate personal stance of pedagogy or take a position on an issue. Extracts and internalises the personal significance of their learning and/or plan their own future learning on the basis of their reflections. Involving reason giving for decisions or events which takes account of the broader historical, social and/or political contexts.

Appendix 9. Framework for analysis of reflective writing (Hatton and Smith 1995:48)

Descriptive	Not reflective Description of events that occurred/report of literature No attempt to provide reasons/justifications for events
Descriptive Reflection	Reflective, not only a description of events but some attempt to provide reason justification for events or actions but in a reportive or descriptive way. For example "I chose this problem-solving activity because I believe that students should be active rather than passive learners" Recognition of *alternate* viewpoints in the research and literature which are reported. For example, Tyler (1949), because of the assumptions on which his approach rests suggests that the curriculum process should begin with objectives. Yinger (1979), on the other hand argues that the "task" is the starting point. Two forms:- (a) Reflection based generally on one perspective/factor as rationale. (b) Reflection is based on the recognition of multiple factors and perspectives.
Dialogic Reflection	Demonstrates a "stepping back" from the events/actions leading to a different level of mulling about, discourse with self and exploring the experience, events, and actions using qualities of judgements and possible alternatives for explaining and hypothesising. Such reflection is analytical or/and integrative of factors and perspectives and may recognise inconsistencies in attempting to provide rationales and critique for example "While I has planned to use mainly written text materials I became aware very quickly that a number of students did not respond to these. Thinking about this now there may have been several reasons for this. A number of students, while reasonably proficient in English, even though they had been NESB learners, may still have lacked some confidence in handling the elvel of language in the text. Alternatively a number of students may have been visual and tactile learners. In any case I found that I had to employ more concrete activities in my teaching." Two forms as in (a) and (b) above.
Critical Reflection	Demonstrates awareness that actions and events are not only located in, and explicable by, reference to multiple perspectives but are located in, and influenced by multiple historical and socio-political contexts. For example, "What must be recognised, however, is that issues of student management experiences with this class can only be understood within the wider structural locations of power relationships established between teachers and students in schools as social institution based upon the principles of control" (Smith 1992).

Appendix 10. Pilot content analysis student interviews

First Interview	Frequency positive	% of total coding	Frequency negative	% of total coding	Frequenc y total	Percentage of Frequencies
Academic Conditions						
Expections of Course	1	0.46%	35	16.06%	36	16.51%
Workload/Time	1	0.46%	24	11.01%	25	11.47%
Integral Part of Course	0	0.00%	1	0.46%	1	0.46%
Examples	0	0.00%	1	0.46%	1	0.46%
Deadlines	1	0.46%	6	2.75%	7	3.21%
Information Overload	0	0.00%	2	0.92%	2	0.92%
Academic Conditions Total	**3**	**1.38%**	**69**	**31.65%**	**72**	**33.03%**
Technical Conditions						
Student Skills	3	1.38%	17	7.80%	20	9.17%
Perception of Age	0	0.00%	4	1.83%	4	1.83%
Training	0	0.00%	8	3.67%	8	3.67%
Support	6	2.75%	15	6.88%	21	9.63%
Technical Conditions Total	**9**	**4.13%**	**44**	**20.18%**	**53**	**24.31%**
						0.00%
System						
Reliability	0	0.00%	4	1.83%	4	1.83%
Accessibility	0	0.00%	3	1.38%	3	1.38%
System Total	**0**	**0.00%**	**7**	**3.21%**	**7**	**3.21%**
						0.00%
Scaffolding						
Tutor Experience	2	0.92%	6	2.75%	8	3.67%
Feedback	5	2.29%	26	11.93%	31	14.22%
Scaffolding Total	**7**	**3.21%**	**32**	**14.68%**	**39**	**17.89%**
Experience of Using						
Purpose	1	0.46%	9	4.13%	10	4.59%
Motivation	2	0.92%	0	0.00%	2	0.92%
Technical Issues	0	0.00%	15	6.88%	15	6.88%
Not easy to use	2	0.92%	2	0.92%	4	1.83%
Priority/Add on	0	0.00%	6	2.75%	6	2.75%
Familisarisation	0	0.00%	3	1.38%	3	1.38%
Confusion	0	0.00%	1	0.46%	1	0.46%
Preference to Paper	1	0.46%	0	0.00%	1	0.46%
Confidence	0	0.00%	5	2.29%	5	2.29%
Experience Total	**6**	**2.75%**	**41**	**18.81%**	**47**	**21.56%**
Total	25	11.47%	193	88.53%	218	100%

Students 2nd Interview	Frequency positive	% of total coding	Frequency negative	% of total coding	Frequency total	Percentage of Frequencies
Academic Conditions						
Mentors do not use PP	0	**0.00%**	4	**1.78%**	4	1.78%
Safeguarding Children	0	**0.00%**	7	**3.11%**	7	3.11%
Duplication of Records	0	**0.00%**	10	**4.44%**	10	4.44%
Course Changes Confusing	0	**0.00%**	20	**8.89%**	20	8.89%
Paperwork not on PP	0	**0.00%**	28	**12.44%**	28	12.44%
Lack of time due to workload	0	**0.00%**	30	**13.33%**	30	13.33%
Use exemplars	0	**0.00%**	0	**0.00%**	0	0.00%
Academic Conditions Total	**0**	**0.00%**	**99**	**44.00%**	**99**	43.99%
Technical Conditions						
Training/Support	0	**0.00%**	13	**5.78%**	13	5.78%
Uploading	0	**0.00%**	17	**7.56%**	17	7.56%
Technical Conditions Total	**0**	**0.00%**	**30**	**13.33%**	**30**	13.34%
Scaffolding						
Tutor Expertise	0	**0.00%**	10	**4.44%**	10	4.44%
Feedback	11	**4.89%**	8	**3.56%**	19	8.44%
Scaffolding Total	**11**	**4.89%**	**18**	**8.00%**	**29**	12.88%
Experience of Using						
Not used collaboratively	0	**0.00%**	1	**0.44%**	1	0.44%
Use email in preference to PP	0	**0.00%**	4	**1.78%**	4	1.78%
Not fit for purpose	0	**0.00%**	5	**2.22%**	5	2.22%
Only working to deadline	0	**0.00%**	7	**3.11%**	7	3.11%
Doesn't model good practice	0	**0.00%**	8	**3.56%**	8	3.56%
Not integral only showcasing	0	**0.00%**	10	**4.44%**	10	4.44%
Didn't use in placement	0	**0.00%**	11	**4.89%**	11	4.89%
Will not use after training	0	**0.00%**	21	**9.33%**	21	9.33%
Experience Total	**0**	**0.00%**	**67**	**29.78%**	**67**	**29.77%**
Total		**0.00%**			**225**	**99.98%**

Students 3rd Interview	Frequency positive	% of total coding	Frequency negative	% of total coding	Frequenc y total	Percentage of Frequencies
Academic Conditions						

Course Changes Confusing	0	0.00%	8	12.31%	8	**12.31%**
PP overwhelming	0	0.00%	6	9.23%	6	**9.23%**
Lack of time due to workload	0	0.00%	10	15.38%	10	**15.38%**
Academic Conditions Total	**0**	0.00%	**24**	36.92%	**24**	
Technical Conditions						
Training/Support	0	0.00%	9	13.85%	9	**13.85%**
Uploading	0	0.00%	4	6.15%	4	**6.15%**
Technical Conditions Total	**0**	0.00%	**13**	20.00%	**13**	
Scaffolding						
Tutor Expertise	0	0.00%	5	7.69%	5	**7.69%**
Feedback	2	3.08%	6	9.23%	8	**12.31%**
Scaffolding Total	**2**	3.08%	**11**	16.92%	**13**	**20.00%**
						0.00%
Experience of Using						
Reflection	5	7.69%	0	0.00%	5	**7.69%**
ICT a barrier	0	0.00%	2	3.08%	2	**3.08%**
Useful to link experiences	0	0.00%	1	1.54%	1	**1.54%**
Didn't use in placement	0	0.00%	4	6.15%	4	**6.15%**
Will not use after training	0	0.00%	3	4.62%	3	**4.62%**
Experience Total	5	7.69%	10	15.38%	15	**23.08%**
Total	7	10.77%	58	89.23%	65	**100.00%**

Appendix 11. Pilot content analysis tutor interviews

Tutor 1st Interview	Frequency positive	% of total coding	Frequency negative	% of total coding	Frequency total	Percentage of Frequencies
Academic Conditions						
Assessment	1	0.83%	1	0.83%	2	1.65%
Students not see connections	0	0.00%	4	3.31%	4	3.31%
Low Priority - students	0	0.00%	1	0.83%	1	0.83%
Workload	0	0.00%	3	2.48%	3	2.48%
Cultural shift-pedagogy	2	1.65%	2	1.65%	4	3.31%
Academic Conditions total	**3**	**2.48%**	**11**	**9.09%**	**14**	**11.57%**
Technical Conditions						0.00%
Time to learn	0	0.00%	1	0.83%	1	0.83%
Training	5	4.13%	3	2.48%	8	6.61%
Potential of system	4	3.31%	2	1.65%	6	4.96%
University led	2	1.65%	0	0.00%	2	1.65%
Technical Conditions Total	**11**	**9.09%**	**6**	**4.96%**	**17**	**14.05%**
System						0.00%
Not robust	0	0.00%	4	3.31%	4	3.31%
New Vocabulary	0	0.00%	3	2.48%	3	2.48%
Track changes	0	0.00%	1	0.83%	1	0.83%
System Total	**0**	**0.00%**	**8**	**6.61%**	**8**	**6.61%**
Scaffolding						0.00%
Feedback	6	4.96%	16	13.22%	22	18.18%
Scaffolding Total	6	4.96%	16	13.22%	22	18.18%
Experience						0.00%
Face 2 face support	0	0.00%	4	3.31%	4	3.31%
Technical issues	0	0.00%	12	9.92%	12	9.92%
Barrier	3	2.48%	5	4.13%	8	6.61%
Time	0	0.00%	12	9.92%	12	9.92%
Reflection	1	0.83%	1	0.83%	2	1.65%
Not upto expectations	2	1.65%	3	2.48%	5	4.13%
Relationships	0	0.00%	2	1.65%	2	1.65%

Student needs	0	0.00%	4	3.31%	4	3.31%
Not adding value	0	0.00%	1	0.83%	1	0.83%
Easy to use	3	2.48%	0	0.00%	3	2.48%
Peer support	7	5.79%	0	0.00%	7	5.79%
Experience Total	16	13.22%	44	36.36%	60	49.59%
Total	**36**	29.75%	**85**	70.25%	**121**	**100.00%**

Tutor 2nd Interview	**Frequency positive**	**% of total coding**	**Frequency negative**	**% of total coding**	**Frequency total**	**Percentage of Frequencies**
Academic Conditions						
Student priority/lack of status	0	0.00%	12	9.30%	12	9.30%
Assessment	17	13.18%	2	1.55%	19	14.73%
Academic Conditions Total	**17**	13.18%	**14**	10.85%	**31**	**24.03%**
Technical Conditions						
Tech support/issues	0	0.00%	8	6.20%	8	6.20%
Training needs students/staff	4	3.10%	3	2.33%	7	5.43%
Control over/design changes	4	3.10%	0	0.00%	4	3.10%
Technical Conditions Total	**8**	6.20%	**11**	8.53%	**19**	**14.73%**
System						
Student difficulty in uploading	0	0.00%	6	4.65%	6	4.65%
Alternative ways	0	0.00%	5	3.88%	5	3.88%
Security	0	0.00%	1	0.78%	1	0.78%
Interoperability with existing	0	0.00%	1	0.78%	1	0.78%
don't know PP	0	0.00%	4	3.10%	4	3.10%
Not robust	0	0.00%	6	4.65%	6	4.65%
Cannot see progression/development	0	0.00%	3	2.33%	3	2.33%
Mechanics impacts on times	0	0.00%	3	2.33%	3	2.33%
Track changes	0	0.00%	5	3.88%	5	3.88%
System Total	**0**	0.00%	**34**	26.36%	**34**	**26.36%**
Experience						
Relationships f2f	0	0.00%	9	6.98%	9	6.98%
not using in way intended	0	0.00%	7	5.43%	7	5.43%

barrier to learning	0	0.00%	6	4.65%	6	4.65%
refined course	3	2.33%	2	1.55%	5	3.88%
does not do what we want it to	0	0.00%	5	3.88%	5	3.88%
scanning time consuming	0	0.00%	5	3.88%	5	3.88%
duplication	0	0.00%	4	3.10%	4	3.10%
not adding value	0	0.00%	2	1.55%	2	1.55%
repository no impact on reflection	0	0.00%	1	0.78%	1	0.78%
negativity to PP by students	0	0.00%	1	0.78%	1	0.78%
Experience Total	**3**	2.33%	**42**	32.56%	**45**	**34.88%**
Total	**28**	21.71%	**101**	78.29%	**129**	**100.00%**

Tutor 3rd Interview	**Frequency positive**	**% of total coding**	**Frequency negative**	**% of total coding**	**Frequency total**	**Percentage of Frequencies**
Academic Conditions						
Assessment	0	0.00%	2	2.38%	2	2.38%
Pedagogy	0	0.00%	2	2.38%	2	2.38%
Attainment	0	0.00%	1	1.19%	1	1.19%
Workload	0	0.00%	12	14.29%	12	14.29%
Academic Conditions Total	**0**	0.00%	**17**	20.24%	**17**	20.24%
Technical Conditions						
Connectivity	0	0.00%	1	1.19%	1	1.19%
Training	0	0.00%	4	4.76%	4	4.76%
Unreliable	0	0.00%	1	1.19%	1	1.19%
Safeguarding	0	0.00%	1	1.19%	1	1.19%
Tech support	0	0.00%	2	2.38%	2	2.38%
Connectivity	0	0.00%	1	1.19%	1	1.19%
Technical Conditions Total	**0**	0.00%	**10**	11.90%	**10**	11.90%
System						
bad design	0	0.00%	10	11.90%	10	11.90%
Track changes	0	0.00%	2	2.38%	2	2.38%
Upload problems	0	0.00%	7	8.33%	7	8.33%
Not robust/tech issues	0	0.00%	3	3.57%	3	3.57%
Ownership	2	2.38%	0	0.00%	2	2.38%
System Total	**2**	2.38%	**22**	26.19%	**24**	28.57%

Scaffolding						
Formative feedback	12	14.29%	0	0.00%	12	14.29%
Scaffolding Total	**12**	14.29%	**0**	0.00%	**12**	14.29%
Experience						
Relationships	0	0.00%	1	1.19%	1	1.19%
two layer approach	0	0.00%	5	5.95%	5	5.95%
BARRIER TO LEARNING	0	0.00%	2	2.38%	2	2.38%
loss of faith	0	0.00%	1	1.19%	1	1.19%
student engagement	0	0.00%	1	1.19%	1	1.19%
accesibility	0	0.00%	1	1.19%	1	1.19%
reflection	0	0.00%	1	1.19%	1	1.19%
access school/it	0	0.00%	3	3.57%	3	3.57%
expectations	0	0.00%	3	3.57%	3	3.57%
time	0	0.00%	3	3.57%	3	3.57%
Experience Total	**0**	0.00%	**21**	25.00%	**21**	25.00%
Total	**14**	16.67%	**70**	83.33%	**84**	100.00%

Appendix 12. Tables relating to section 5.2

Table 1. Students' responses to initial questionnaire on issues of confidence and anxiety associated with the use of ICT

		1	2	3	4	5	6	Total
Confidence using a computer	n	0	2	2	6	32	32	74
	%	2.7	2.7	8.1	6	43.2	43.2	100
Anxiety when presented with new programs	n	6	19	14	21	14	0	74
	%	8.1	25.7	18.9	28.4	18.9	0	100

N = 74 Scale: 1=low 6-high

Table 2. Students' responses to initial questionnaires on issue of prior e-portfolio use

	Main Study		
Q3 Have you used an e-portfolio before?	Yes	18	24.3
	No	56	75.7

Table 3. Student Responses to the initial questionnaire on the issue of prior use of a reflective journal

	Main Study		
Q5 Have you been asked to keep a reflective journal/diary in any other institution?	Yes	18	24.3
	No	56	75.7

Table 4. Student responses to the initial questionnaire on issues of their preference to paper or electronic storage

	Main Study		
Q4 Do you prefer to keep paper copies or electronic copies of important documents and records?	Paper	42	56.7
	Electronic	15	20.3
	Both	16 (1 no response)	21.6

Table 5. Student responses to initial questionnaire on frequency of using email and social networking

	Main Study		
Q6a How frequently do you choose to use email or a social networking site? Email	Everyday	70	94.6
	Weekly	4	5.40
	Fortnightly	0	0
	Hardly Ever	0	0
	Never	0	0
Q6b Social Networking Site	Everyday	47	63.5
	Weekly	7	9.4
	Fortnightly	3	4.0
	Hardly Ever	7	9.4
	Never	10	13.5

Table 6. Student responses to the initial questionnaire on agreement to interview

	Main Study		
Q7 Agree to interview	Yes	28	37.8
	No	45	60.8

Table 7. Student responses to the initial questionnaire expressing agreement to complete a further questionnaire

	Main Study		
Q8 Agree to further questionnaire	Yes	62	83.8
	No	10 (2 no response)	13.5

Table 8. Student responses to the initial questionnaire on issue of purpose for the implementation of the e-portfolio

	Main Study		
Q9 Do you know why you are being asked to keep an e-portfolio?	Yes	61	82.4
	No	13	17.6

Appendix 13. Main study second questionnaire

I would be grateful if you would complete this questionnaire comprising of seven questions by highlighting the number or word that best describes your situation. Below each question is a box for any comment you would like to add. All responses will be treated confidentially and used only to inform the research, anonymity of participants will be maintained throughout the study. Thank you for your help in this matter.

Jeanette Mills (jeanette.mills@.....ac.uk)

Question	Answer
1. How many times have you received feedback on work uploaded to the e-portfolio?	None/one/two/three/four/more than four
Comment:	
2. How did you receive the feedback?	Through e-portfolio/Email/Face to Face/Other
Comment:	
3. Do you think you have the IT skills to use the e-portfolio?	Yes/No
Comment:	
4. Do you have access to technical support on how to use the e-portfolio?	Yes/No (if yes please specify)
Comment:	
5. How many hours do you spend on the e-portfolio each week?	Hours per week = Whilst in University/Placement/Both
Comment:	
6. Now you have used the e-portfolio, do you understand why it is being used on this course?	Yes/No
Comment:	
7. Would you like more training?	Yes/No
Comment	

Thank you for completing this questionnaire.

Appendix 14. Main Study Student Initial Questionnaire data

	Question 1		Question 2		Question 3	Question 4	Question 5	Question 6 (a)		Question 6 (b)	Question 7
Possible 100 75% return	How confident do you feel in using a computer? (1=low 6=high)		How anxious do you feel when presented with computer programs you have never met before? (1 = low 6 = high)		Have you used an e-portfolio before?	4. Do you prefer to keep paper copies or electronic copies of important documents and records?	5. Have you been asked to keep a reflective journal/diary in any other institution?	6a. How frequently do you choose to use email or a social networking site?			7. Do youknow why you are being asked to use the e-portfolio? (BREO)
Score	Freq	%	Freq	%							
1	0	0	6	8	No = 56 (76%)	Paper = 42 (57%)	Yes = 20 (27%)		Email	Social Networking	Yes = 61 (82%)
2	2	3	19	26	Yes = 18 (24%)	Electronic = 15 (20%)	No = 54 (73%)	Everyday	70 (95%)	47 (64%)	No = 28 (38%)
3	2	3	14	19		Both = 16 (22%)		Weekly	4 (4.5%)	7 (9%)	
4	6	8	21	29		No response = 1 (1.3%)		Fortnightly	0	3 (4%)	
5	32	43	14	19				Hardly ever	0	7 (9%)	
6	32	43	0	0				Never	0	10 (14%)	

Appendix 15. Main Study Student Second Questionnaire data

Second Questionnaire														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. E-portfolios are underpinned by the theory of social constructivism; the more informed other scaffolding your learning through feedback. From interacting with the e-portfolio on BREO, would you agree this statement reflects your own experience of working with the e-portfolio?	Yes	Yes	Yes	No	No	No	Yes	Yes	No	No	No	Yes	Yes	No
2. How many times have you received feedback on work uploaded to BREO? Please comment on what you did as a result of this feedback.	>4	two	three	>4	three	four	>four	>4	two	two	three	three	two	four
3. How did you receive the feedback?	no response	no response	Email	e-p Email	e-p Email	e-p Email	e-p Email f2f	e-p Email	Email	e-p	e-p	e-p Email	Email other	Email
4. Do you think you have the IT skills to use BREO effectively?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	yes	Yes	Yes	Yes	Yes	Yes
5. If you need help using the e-portfolio who do you ask?	Tutor Peers	Tutors Peers	Peers	Tech support, peers, librarians	peers	peers	peers	Tutor, peers	peers	N/A	peers	tutor	Tutor	peers
6. How many hours do you spend on BRO each week?	1 to 10	1 to 2	2 - Uni	5 - 6 in Uni	2 - both	2 - both	4 - both	1 - 2 both	5 - both	2 - both	2 - both	2 - Uni	1 max - both	3 - both
7. Now you have used BREO, do you understand why it is being used on this course?	Yes	Yes	Yes	Yes	Yes	Yes		Yes	yes	Yes	Yes	Yes	Yes	Yes
8. Would you like more training? If yes, what on and why?	No	No	No	No	Yes	No		No	No	No	No	No	No	No

Appendix 16. Module Handbook – Description of 'tasks' (2010/11:37-47)

Reflective Journal: Tasks

This section will enable you to engage with a range of important current aspects of life in school and will help to give you a wider and deeper understanding of the complex nature of teaching and the multiplicity of a teacher's roles and responsibilities.
You will need to plan carefully when you will do each task. We recommend that you do these tasks, wherever possible, in the first part of the placements. Once the placement develops you will be teaching for a greater percentage of the week and it will be hard to find the time to complete the tasks.

Task RJ1: Safeguarding Children in Practice

To be done in both placement A and B:
Check who the designated Child Protection Person is in your school.
Put a copy of the school's policy on safeguarding children in your webfolio.
Annotate the policy to demonstrate your 5 key learning points - summarise them here.

Task RJ2: English as an Additional Language

Planning for children for whom English is an additional language.
If you are teaching in a class where you have children for whom English is an additional language submit an annotated lesson plan showing how you cater for their needs . If you are not in a school where there are children for whom English is an additional language take a lesson you have taught and annotate the plan to explain how adaptations could be made in order that such children would be fully included in the learning.

Task RJ3: Special Educational Needs

To be done in both placement A and B
Choose a child in the class you are working with who has special educational needs (this could include being gifted and talented).
Describe the learning needs of the child, referring to the child's Individual Education Plan (or equivalent) if appropriate, and indicating what stage the child is at (School Action, School Action Plus, Statemented)
Produce a 'map' to show how the child is being supported. This should indicate the different adults who support the child's learning, whether directly or indirectly (eg the SENCO), and the work they do.
Evaluate how well you think this support is working in meeting the child's stated needs. Consider also the extent to which you feel that any written documentation is an accurate reflection of the child's needs.

Task RJ4: Classroom Organisation

Reflect on the purposes of classroom display. In what ways can good displays support children's learning in the broadest sense? Take photos of classroom displays and explain their use and impact. Ask children about the displays and get their opinions. Write about 300 words on your thoughts and what you have found out from the children.
In Placement A and B develop a Working Wall in your classroom. Take photos of them and upload these to your webfolio. Ask children about the displays and get their opinions. Write

about 200 words about each of these Working Walls explaining their impact and what the children think of them.

Task RJ5: Behaviour Management

From your reading about behaviour management summarise what you think are the key aspects of effective behaviour management (about 500 words).
In both Placement A and B describe some of the ways your class teacher manages the behaviour of the children (particularly of any children who present more challenging behaviour) and reflect on the effectiveness of these strategies (about 300 words). Do this in the first week of each placement.
In both Placement A and B get a copy of the school's Behaviour Management Policy (or equivalent) and upload it to your webfolio. Identify ways in which you see this being put into action (or not being put into action) around the school – for example at playtime, in assembly, as children walk around the school. (About 300 words for each placement)
In both Placement A and B reflect on the way that you have managed the behaviour of the children. What strategies have worked; what strategies have been less successful. Why? Use your wider reading in your discussion. (About 500 words for each placement)

Task RJ6: Differentiation

To be done in Placement A and B
Choose a lesson you are teaching where there is clear differentiation. Upload the lesson plan to your webfolio. Write about 300 words explaining why you thought the differentiation was appropriate (ie what knowledge you had of the children's prior attainment), how well it worked in practice, and what evidence you have of children's engagement and learning as a result. It is equally useful to discuss a lesson where your planned differentiation did **not** achieve what you hoped it would. It may be helpful to upload some copies of children's work.

Task RJ7: Assess, Plan, Teach, Evaluate

1. To be done at the start of Placement A

Find out how the school organises its planning in different areas of the curriculum – identify long term planning, medium term planning and short term planning. Keep relevant copies of planning proformas in your School Experience file.

2. To be done near the beginning of Placement A

Working with your class teacher/mentor, plan a short activity in a subject other than maths or English that will allow you to assess an appropriate aspect of the learning of a small group of children (eg 3). Be certain that you are clear what knowledge, skills or understanding you are assessing.
Write about 200 words summarising what you have found out and what this tells you about what they need to learn next.
To be done by Friday 10 December
Plan a lesson or a section of a lesson. Give the lesson plan to your class teacher and ask her/him to teach from it. Observe the lesson and use the lesson observation sheet to evaluate it. Upload the completed evaluation to your webfolio. The aim of this activity is firstly to see if your own written plan can be interpreted by someone else (this is essential for when a supply teacher takes your class), and secondly to give you a better understanding of how to assess a lesson.

3. To be done in Placement B

Prior to starting a unit of work in any subject area, find out what records there are (if any) of the children's prior learning.
Plan an activity that will allow you to assess the children's knowledge, skills or understanding in relation to the planned unit of work. Write about 300 words summarising what you have found out and what the implications are for your planning of the unit of work.
It may be useful to upload examples of children's work.

4. To be done towards the end of Placement B
Write an end of year report for one child in the class you have been teaching. Use the report format that your placement school uses.

Task RJ8: Ethos and School Uniqueness

In both Placement A and B.
What is the vision of the school? How can you see this in practice throughout the school day? How does the school consider itself to be unique? What is the school ethos? Take the opportunity to speak to all stakeholders - governors, staff, parents, children. Do they all share the same views? What are the key messages? Write about 200 words for each placement.

Task RJ9: Ofsted and Data

To be done during Placement B
Using Ofsted Reports/RAISEonline data. (RAISEonline is Reporting and Analysis for Improvement through School Self-Evaluation).
You will need to seek out members of the Senior Management/Leadership Team and have discussions with them about this. RAISEonline data is confidential and schools may wish not to share this with you. End of Year 6 assessment data is in the public domain, so should be readily accessible.
From the most recent Ofsted report of the school and/or the RAISEonline data choose a subject area or an aspect which requires development. Search for Ofsted reports at www.Ofsted.gov.uk
Discuss this with your mentor/class teacher. What would it mean for you as a teacher in your current class? What you would do to further develop the children's learning in this area/aspect?
Find out from your mentor/class teacher what data on end of year tests and assessments exists for the children in the class. What are the targets for end of year attainment for children in your class, and how have they been arrived at? Does the school use Fischer Family Trust (FFT) predictions for end of Key Stage 2 attainment? How does the school record children's progress from term to term and year to year. Write about 500 words summarising what you have found out. Include examples of any tracking sheets the school uses (making sure that any children's names have been blanked out).

Task RJ10 (EY and EPP): Progression and Transition

During the 4 weeks you have allocated for research, plan to spend four or five days in a different setting to get a contrasting outlook. For example, if you are Early Years go into a Year 6 class or if you are on the EPP strand in a very rural school, spend some time in an urban school. Make the focus of your visit not only about comparing the differences, but consider how transition between year groups or schools happens and how teachers enable children to progress.
Consider the implications for the transition of children at key points in their learning journey: e.g. EYFS to Yr1, Yr2 to Yr3, Yr6 to Yr7
Write about what you have learned from this experience (about 500 words)

Task RJ10 (PML): Reflections of Experience Abroad

Reflect on what you have learned from your 4 weeks abroad. In what ways are the educational systems different to what you have experienced in England? In what ways does this impact on the learning and behaviour of the children? What have you learned from the teaching you have done in this placement? (about 500 words)

English Curriculum Tasks

Task E1: English Subject Knowledge.

The audit of your English subject knowledge will be done during the induction period. Following the audit identify aspects you need to develop and take action to improve your subject knowledge. Upload to your webfolio your action, giving details of your strengths and weaknesses and how you will address weaknesses during the course.

Task E2: Resources

To be completed during Placement A

- Investigate the resources, visual aids and ICT available to you/pupils for learning and teaching English. Compile a list useful to you for future reference.
- With permission, take photographs of English on display. Write about how these displays support/contribute to pupils' learning. Include comments on how the displays of children's work are used to motivate/encourage their English knowledge and understanding.

Task E3: Observations

To be completed between 1/11/10 and 12/11/10.

- Observe a phonic lesson. Use the phonic sheet to record your observation. Please note that if your Placement A school is a junior school or a middle school then you will not be able to do this until Placement B when you will be teaching in a Key Stage 1 class.
- Observe a guided reading lesson in your placement and write up your reflections on the teaching that you observed. This should include teaching and group management, subject knowledge, planning and preparation and assessment for learning.
- Observe the teaching of early reading (Foundation, Key Stage One). Write up your reflections on the teaching that you observed. This needs to include teaching and classroom/group management, subject knowledge, planning and preparation and assessment for learning. Please note that if your Placement A school is a junior school or a middle school then you will not be able to do this until Placement B.
- Conduct a reading interview and/or a miscue analysis with one pupil. Record this and then evaluate the evidence gathered to consider and identify the pupil's current reading ability. Identify and comment on the 'next steps' for this pupil in order to further his/her reading development.

Task E4: Observation

To be completed between 29/11/10 and 10/12/10

- Observe a writing lesson in your placement and write up your reflections on the teaching you observed. This should include teaching and classroom management, subject knowledge, planning and preparation and assessment for learning.
- Conduct a writing interview with a small group of pupils (suggest 3). Incorporate a more able, average and less able pupil within this group.

Task E5: Writing activity

To be completed by 15/2/11

- Plan a writing activity for a group/ whole class.
- Record and evaluate this activity.
- Assess the three pupils' work (group previously interviewed) using APP (Assessing Pupil Progress) following the planned activity.
- Compare and evaluate the learning that took place for these three pupils.
- Evaluate your activity making comments on the learning that took place for the three levels of differentiation.

Task E6: Phonics and Reading

To be completed by 8/4/11

- Teach a phonic lesson and note reflections on your teaching.
- Teach a guided reading lesson in your placement and note reflections on your teaching.
- Observe the teaching of early reading (Foundation, Key Stage One). Write up your reflections on the teaching that you observed. This needs to include teaching and classroom management, subject knowledge, planning and preparation and assessment for learning.
- Compare the approaches of your placement A and B schools with reference to the teaching and classroom management, subject knowledge, planning and preparation and assessment for learning.

Task E7: Speaking and Listening

To be completed by 1/7/11

- Plan a collaborative speaking and listening activity.
- Observe and record pupils' talking.
- Record and evaluate this activity including the types of talk and learning that emerge as a result of it.

Task E8: English Subject Knowledge

To be completed by 1/7/11

- Repeat the audit for English subject knowledge as appropriate. Upload the result to your webfolio.

Mathematics Curriculum Tasks

TASK M1 : Mathematics Subject Knowledge

To be done by 1/10/10

To help you review your knowledge and understanding of the mathematics curriculum, you will undertake an audit at the start of the course.

To support development you should purchase a copy of *'Primary Mathematics Audit and Test: Assessing Your Knowledge and Understanding'* by Mooney & Fletcher (see Reading List) and work through the exercises as appropriate. You may need to undertake work, relevant to personally identified needs, using the website for the Centre of Innovation in Mathematics Teaching www.cimt.plymouth.ac.uk.

Upload to your webfolio:

- An electronic version of the summary mark sheet
- Your action plan summarising your strengths and weaknesses and giving details of how you will address areas of relative weakness during the course.

TASK M2: Resources for learning and teaching mathematics

To be done by 12/11/10

'The value and need for mathematical resources is argued in terms of Bruner's model of enactive, iconic and symbolic modes of thinking and how children move from the concrete to the representational in their ideas.' Drews, D. and Hansen, A. (2007) *'Using resources to support mathematical thinking'* Learning Matters

- Consider the Resources List (included in this handbook) as a checklist and investigate the resources, visual aids and ICT available to you/pupils for learning and teaching mathematics in your Placement

A school. Make a list of available resources and place it in your Learning and Teaching English and Mathematics File.
- With permission, take photographs of mathematics on display in your placement school and add these to your file.
- File the list of ITPs used for teaching with the resources list. http://nationalstrategies.standards.dcsf.gov.uk/search/primary/results/nav:49918

TASK M3: Observe a mathematics lesson in school

To be done by 12/11/10
If possible, observe the school mathematics coordinator/specialist teacher.
Write a short account of this lesson and highlight five key implications for your teaching based on this observation of mathematics teaching. (Use bullet points)
The sheet of Mathematics Lesson Evaluation Prompt Questions will help you identify what to observe.

TASKS M4 and M5*:* Assessing Pupils' Progress

These tasks will enable you to explore materials for Assessing Pupils' Progress (APP) and the Foundation Stage Profile (if working in a nursery or reception class) and consider what is involved in making judgements about children's learning and achievement in mathematics.

TASK M4 - Assessing Pupils' Progress in Mathematics 1

To be done by 11/2/11.

If you are working in a Nursery or Reception class

Discuss with your class teacher the best way to identify the ability in counting of one child. It may be appropriate to work with a child or it may be more appropriate just to observe a child. Look at the Problem solving, Reasoning and Numeracy section within the Early Years Areas of Learning and Development (http://nationalstrategies.standards.dcsf.gov.uk/earlyyears/eyfsareasoflearninganddevelopment) and identify an aspect that is relevant. Decide on a practical task or tasks that will allow you to assess the child against the chosen focus.
In bullet point format **record;**
- your focus for the observation/conversation
- your observations
- your judgements about what the child knows and can do at this point in time
- your thoughts about what you think the child needs to learn next

Use diagrams and snippets of conversation as appropriate.
Guideline: about 300 words.

If you are working in a KS1 or KS2 class

Discuss with your class teacher the best way to complete this task.
Work with a child for about 10 to 15 minutes to assess their understanding of number (e.g. about their ability to calculate mentally, to record informally or formally, to explain what they are doing and thinking)
Go to the National Strategies website and find the Mathematics Standards Files. From the list of children's files on the site, pick a child of the age group of your class and scan the teacher's notes relating to the child's understanding of Ma2 Number. Use the Framework for Mathematics on the National

strategies website to help you decide what is appropriate to discuss with the child from your class. Using resources/visual aids as appropriate, talk to one child about his/her understanding of number.
In bullet point format record:

- your focus for the conversation
- your observations
- your judgements about what the child knows and can do at this point in time
- your thoughts about what you think the child needs to learn next

Use diagrams and snippets of conversation as appropriate.

TASK M5 Assessing Pupils' Progress in Mathematics 2

To be done by 1/7/11. Note that APP is not statutory but that most schools are adopting it as a way to structure teacher assessment in Key Stages 1 and 2.

Look first at the following sections of the Primary Framework:
http://nationalstrategies.standards.dcsf.gov.uk/node/18482?uc=force_uj.
http://nationalstrategies.standards.dcsf.gov.uk/node/158217
http://nationalstrategies.standards.dcsf.gov.uk/node/19753

If you are working in a Nursery or Reception class

The purpose of this task is to enable you to assess children's understanding in Problem Solving, Reasoning and Numeracy using the Foundation Stage Profile.
Look first at the information about the Statutory Framework for EYFS at
http://nationalstrategies.standards.dcsf.gov.uk/node/84020?uc=force_uj,
http://nationalstrategies.standards.dcsf.gov.uk/node/83813?uc=force_uj
http://nationalstrategies.standards.dcsf.gov.uk/node/83999?uc=force_uj , From
http://nationalstrategies.standards.dcsf.gov.uk/node/84551 download the Assessment Scales Reference Sheet, and from http://nationalstrategies.standards.dcsf.gov.uk/node/113520 download the EYFS Profile Handbook.
Use the resources to identify an assessment focus for three children. Choose one of the three strands within Problem Solving, Reasoning and Numeracy: Numbers as labels and for counting, Calculating, Shape space and measures.
Devise appropriate activities that will allow you to assess the children using the assessment scales reference sheet. Write about 200 words about each child to explain and justify your assessments.
Summarise what you think each child needs to learn next.
If possible do this in collaboration with your class teacher so that you can moderate the assessments.

If you are working in a KS1 or KS2 class

The purpose of this task is to enable you to level children's work in mathematics using the APP materials. You will consider an Attainment Target that relates to the mathematics work covered during Placement B and make a judgement about the work of 3 children in relation to National Curriculum levels.
Look first at the following sections of the Primary Framework:
http://nationalstrategies.standards.dcsf.gov.uk/node/18482?uc=force_uj
http://nationalstrategies.standards.dcsf.gov.uk/node/158217
http://nationalstrategies.standards.dcsf.gov.uk/node/19753
Pick a NC Attainment Target and determine the mathematics Assessment Focuses. A possible link is
http://nationalstrategies.standards.dcsf.gov.uk/node/18820?uc=force_uj
Then consider the work for three children to judge the National Curriculum level achieved for the selected Assessment Focus.

For support and guidance, look at the Assessment Guidelines related to this aspect of mathematics children (download these from http://nationalstrategies.standards.dcsf.gov.uk/node/18820?uc=force_uj).
Look at the Standards Files to aid your judgements
Use the appropriate 'Mathematics Assessment Guidelines' to record your judgements, and write about 200 words about each child to justify your assessments. Summarise also what you think each child needs to learn next.
If possible do this in collaboration with your class teacher so that you can moderate the assessments.

Task M6: Mathematics Subject Knowledge

To be done by 1/7/11
Repeat the audit for Mathematics subject knowledge as appropriate and upload your score to your webfolio

- Update your maths action plan showing evidence of how you have addressed areas of weakness in your subject knowledge

Appendix 15 – Module Handbook 2010/11 – Description of 'themes and issues' (2010/11:36-38)

Reflective Journal: Themes and Issues

This section asks you to reflect critically on a range of significant and current educational themes and issues, drawing on your wider reading of research and theory, University sessions and school experience. Although you will be writing in the first person, these sections are expected to be written in an appropriate academic style (for example using accurate and complete referencing).
From the nine areas you will choose five to develop at Masters level. The other three can be presented at Professional level. Each section should be a minimum of 1000 words.
Each section below has some prompts to help you get started on the topics, and to identify some possible relevant avenues to explore, but do not feel constrained by these. Resist the temptation to try to cover everything – reduce the range of topics you are discussing in order that you develop an in-depth discussion of issues that you consider to be important.

What is Learning?

Schools are places where learning takes place. But what do we really know about what learning actually is? What insights do different theoretical approaches give us as teachers? What do we know about the most effective pedagogical approaches to teaching? What is neuroscience telling us about the nature of learning, and what implications are there for pedagogy? Does the notion of 'learning styles' have any validity or usefulness?

Inclusion, Equal Opportunities and Diversity

What does it mean for a school to be 'inclusive'? If a school is 'effective' does it necessarily mean that it has also to be inclusive? What are the potential barriers to learning that different groups of children might face and what can be done about them (eg boys/girls, gifted and talented children, children with special educational needs in learning and/or behaviour, children for whom English is an additional language, bi-lingual children, refugee children, children from particular ethnic or socio-economic groups)?

Differentiation and Personalisation

Personalised learning doesn't mean that every child has a 'personal curriculum' planned by the teacher. So what does it mean? What implications does the 'personalised learning' agenda have for teachers and schools? How do learning theories help us understand what personalised learning might be?

What does differentiation mean in practice – exactly what gets differentiated in practice in lessons? Is there a danger that differentiation might limit children's learning? How can this be avoided?

Assessment for Learning and Assessing Pupils' Progress

From your wider reading about assessment, discuss what you consider to be some of the main current issues regarding formative and summative assessment in schools. Relate this critically to your experience in your placement schools. Does all AfL do what it is designed to do – support enhanced learning? Do 'thumbs up, thumbs down' or 'traffic lights' necessarily have an impact on learning? How can we ensure that success criteria enhance learning, rather than become an automated chore?

Approaches to Curriculum Design

There are only about 1000 hours in a school year. How do we make decisions about what to include in the curriculum and what to leave out? What principles and values are used to inform these decisions? Although the new government has rejected the Rose Report (the 'Independent Review of the Primary Curriculum') on the primary curriculum, many schools are actively looking at new ways to organise the curriculum. Why are they doing this, and what do they hope to achieve? Does the recently published

Cambridge Primary Review help us map out a curriculum fit for the 21st century? Technology is developing at a huge speed. What implications does this have for curriculum design?

Collaborating with other Professionals and Parents

A recent authoritative report suggested that the huge increase in the numbers of teaching assistants in recent years has had little measurable impact on children's learning. So has the money been wasted? How do other adults work together to support children's learning (e.g. educational psychologist, speech and language therapist, school nurse, community liaison police officer, sports coordinator)? Why is parental involvement important? What are the barriers to achieving this and what can be done about this?

Classroom Management and Organisation

How can classrooms be organised to maximise learning? What do we know about purposeful talk and how to encourage this? To what extent is 'group work' really collaborative group work, or is it just children sitting around a table but doing individual work? Why might it be important to encourage collaborative group working?

Learning and Teaching Maths

Remember to keep your action plan updated!

Use the University sessions on mathematics and your wider reading to reflect critically on your experience of teaching mathematics in school. Include any relevant experience of observing others teach mathematics. What does it mean to 'think mathematically'? What do we know about the best ways to help children develop as successful mathematicians?

Learning and Teaching English

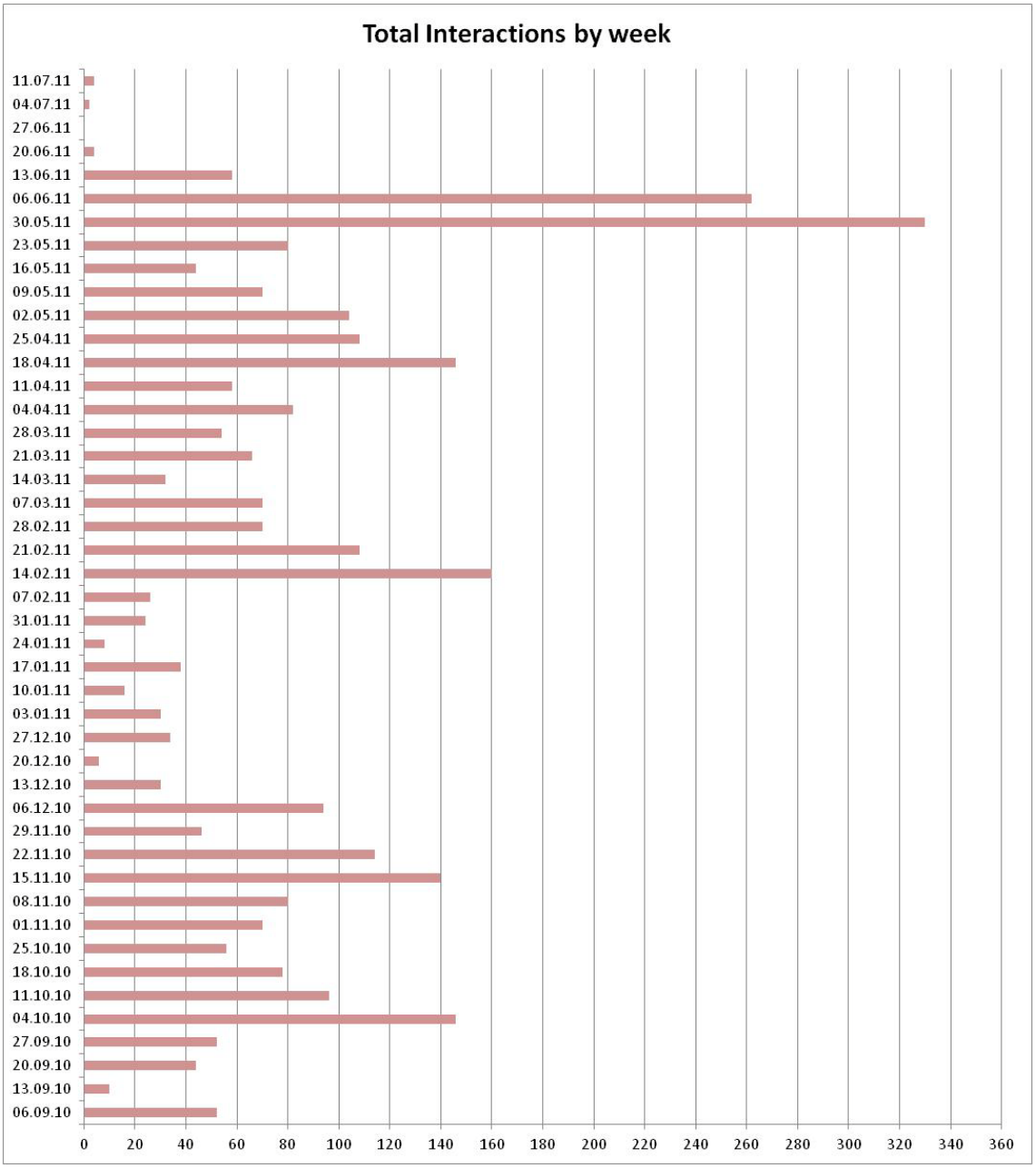
Remember to keep your action plan updated!
Use the University sessions on English and your wider reading to reflect critically on your experience of teaching mathematics in school. Include any relevant experience of observing others teach English. What do we know about the best ways to help children develop as fluent readers and writers, as articulate speakers and effective listeners? Is synthetic phonics the best way to teach young children to read?

Appendix 17 - Student Interactions With 'themes and issues' and 'tasks' over duration of course

Student	No Interactions with Reflective Practitioner Module 'themes and issues'				Total T&I % of student total interactions	No. Interactions on tasks				Total tasks	Total interactions
	Uni wks	School wks	Hols	Study Leave		Uni weeks	School weeks	Hols	Study Leave		
1	14(48%)	6(21%)	8(28%)	1(3%)	29(31%)	25(39%)	37(58%)	0	2(3%)	64(69%)	93
2	0	1(11%)	4(44%)	4(44%)	9(14%)	23(40%)	23(40%)	6(11%)	5(9%)	57(86%)	66
3	4(31%)	0	9(69%)	0	13(19%)	23(40%)	24(42%)	9(16%)	1(2%)	57(81%)	70
4	34(65%)	3(6%)	10(19%)	5(10%)	52(45%)	22(35%)	29(46%)	10(16%)	2(3%)	63(55%)	115
5	0	8(32%)	17(68%)	0	25(29%)	7(12%)	47(78%)	2(3%)	4(7%)	60(71%)	85
6	0	9(56%)	3(19%)	4(25%)	16(17%)	21(27%)	44(56%)	10(13%)	4(5%)	79(82%)	95
7	1(8%)	1(8%)	10(77%)	1(8%)	13(19%)	21(37%)	20(35%)	16(28%)	0	57(81%)	70
8	2(20%)	1(10%)	6(60%)	1(10%)	10(20%)	10(25%)	6(15%)	21(53%)	3(8%)	40(80%)	50
9	16(40%)	5(13%)	13(33%)	6(15%)	40(26%)	47(41%)	34(30%)	25(22%)	8(7%)	114(74%)	154
10	1(5%)	3(14%)	15(68%)	3(14%)	22(26%)	22(25%)	25(40%)	4(6%)	11(18%)	62(74%)	84
11	5(100%)	0	0	0	5(15%)	20(69%)	9(31%)	0	0	29(85%)	34
12	10(36%)	5(18%)	13(46%)	0	28(31%)	21(34%)	28(46%)	12(20%)	0	61(68%)	89
13	6(25%)	3(13%)	12(50%)	3(13%)	24(31%)	20(37%)	29(54%)	3(6%)	2(4%)	54(69%)	78
14	2(17%)	0	9(75%)	1(8%)	12(27%)	8(24%)	20(61%)	2(6%)	3(9%)	33(73%)	45

15	3(12%)	9(6%)	11(44%)	2(8%)	25(23%)	13(16%)	48(58%)	19(23%)	3(4%)	83(77%)	108
16	33(50%)	4(6%)	13(20%)	16(24%)	66(32%)	47(33%)	39(27%)	45(32%)	11(8%)	142(68%)	208
17	28(51%)	3(5%)	12(22%)	12(22%)	55(35%)	37(36%)	32(31%)	32(31%)	1(1%)	102(65%)	157

Appendix 18. Interactions by sample with e-portfolio (all sections) per week of the course section



Appendix 19. Feedback given by tutors and specialist tutors on work uploaded by students to 'tasks'

Number of tasks that received feedback from tutors and specialists by area throughout the course

Feedback	Sept		Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		June	
	Tutor	Specialist	Tutor	Specialist	Tutor	Specialist	Tutor	Specialist	Tutor	Specialist	Tutor	Specialist	Tutor	Specialist	Tutor	Specialist	Tutor	Specialist	Tutor	Specialist
English Tasks f/b totals	0	0	0	0	0	2	0	11	0	3	0	1	0	0	0	1	0	1	0	15
Mathematics Tasks f/b totals	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Reflective Journal f/b totals	0	0	1	0	0	0	0	0	0	0	0	0	17	0	5	0	5	0	25	0
Action Plan, Pre course f/b totals	5	0	12	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	5	0	13	0	1	2	0	11	0	3	0	2	17	0	5	1	5	1	40	16
%	4.10	0	10.66	0	0.82	1.64	0	9.02	0	2.46	0	1.64	13.93	0	4.10	0.82	4.10	0.82	32.79	13.11

Feedback English task = 34 specialist, 11 tutor
Feedback Maths Tasks = 2 specialist, 4 tutor
Feedback Action Plans, Pre-course task = 18 tutor
Feedback Reflective Journal tasks = 53 tutor
Number of feedback against total trainee interactions for tasks

	English Feedback		Maths Feedback		Tutor Feedback					
Student	No. f/b points	%	No. f/b points	%	No. f/b points	%	TOTAL	% of total f/b	Total student interactions	% of interactions receiving f/b
1	0	0	0	0	2	1.64	2	1.64	64	3.15
2	0	0	0	0	0	0	0	0	57	0
3	0	0	0	0	6	4.92	6	4.92	57	10.53
4	3	2.46	0	0	1	0.82	4	3.28	63	6.35
5	2	1.64	0	0	6	4.92	8	6.56	60	13.33
6	0	0	0	0	1	0.82	1	0.82	79	1.27
7	0	0	0	0	14	11.48	14	11.48	57	24.56
8	3	2.46	0	0	6	4.92	9	7.38	40	22.50
9	4	3.28	0	0	4	3.28	8	6.56	114	7.02
10	4	3.28	0	0	5	4.10	9	7.38	62	14.52
11	2	1.46	1	0.82	2	1.64	5	4.10	29	17.24
12	6	4.92	1	0.82	4	3.28	11	9.02	61	18.03
13	1	0.82	0	0	4	3.28	5	4.10	54	9.26
14	3	2.46	0	0	11	9.02	14	11.48	33	42.42
15	3	2.46	0	0	15	12.30	18	14.75	83	21.69
16	3	2.46	0	0	3	2.46	6	4.92	142	4.23
17	0	0	0	0	2	1.64	2	1.64	102	1.96
Total	34	27.7	2	1.64	86	70.52	122	98.35	1157	

Appendix 20. Feedback from Tutors to students on work uploaded to 'Themes and Issues'

* Indicates Theme/Issue selected for Masters Level work

Student	What is Learning	Assessment for Learning and Assessing Pupils' Progress	Collaborating with other Professionals and Parents	Inclusion, Equal Opportunities and Diversity	Approaches to Curriculum Design	Classroom Management and Organisation	Differentiation and Personalisation	Learning and Teaching Maths	Learning and Teaching English	Total
1		03.01.11		11.03.11	*	*	11.03.11 *	*	*	3
2	16.06.11 *	16.06.11 *	16.06.11 *				16.06.11 *	16.06.11 *		5
3	03.03.11 * 17.05.11	17.05.11 * 21.12.10	02.06.11 *	17.05.11 21.12.10	17.05.11	17.05.11 * 21.12.10	17.05.11 *		02.06.11	12
4	*			20.03.11	*	20.03.11 *	20.03.11	20.03.11 *	*	4
5	07.06.11	*	10.06.11 * 30.05.11	10.06.11 * 09.01.11	10.06.11 *	10.06.11 * 09.01.11				8
6	19.01.11 *	23.03.11 *	*	23.03.11 *			19.01.11 *			4
7		*		01.03.11* (f/b uploaded by student)	*	*		06.09.11* (f/b uploaded by student)		2
8		18.01.11 *	*	04.03.11 *	*	*				2
9	19.01.11	21.03.11 *	*	*		*	19.01.11 *			3
10	16.05.11 *	*		10.06.11 *		01.03.11 *	01.03.11 *	17.03.11		5
11	03.12.10 *	03.12.10 *			*					2
12	18.01.11 *			*		*		20.03.11 *	20.03.11 *	3
13	07.06.11 *	07.06.11 *	*	09.01.11 * 07.06.11		*	07.06.11 03.06.11	07.06.11		7
14	*	*	*	*			15.06.11 *			1
15	17.02.11 *	*	*	*			*			1
16	23.04.11 *	18.01.11 *				18.01.11 *	*	20.03.11 *		4
17	18.01.11 *	20.03.11 *		18.01.11 *		20.03.11 *		*		4
										70

Appendix 21. Feedback from tutors sorted into tutor groups

Tutor	Student	What is Learning	Assessment for Learning and Assessing Pupils'Progress	Collaborating with other Professionals and Parents	Inclusion, Equal Opportunities and Diversity	Approaches to Curriculum Design	Classroom Management and Organisation	Differentiation and Personalisation	Learning and Teaching Maths	Learning and Teaching English	Total
1	1		03.01.11		11.03.11	*	*	11.03.11*	*	*	3
	11	03.12.10*	03.12.10*			*					2
2	4	*			20.03.11	*	20.03.11*	20.03.11	20.03.11*	*	4
	6	19.01.11*	23.03.11*	*	23.03.11*			19.01.11*			4
	8		18.01.11*	*	04.03.11*	*	*				2
	9	19.01.11	21.03.11*	*	*		*	19.01.11*			3
	12	18.01.11*							20.03.11*	20.03.11*	3
	16	23.04.11*	18.01.11*				18.01.11*	*	20.03.11*		4
	17	18.01.11*	20.03.11*		18.01.11*		20.03.11*				4
3	2	16.06.11*	16.06.11*	16.06.11*				16.06.11*	16.06.11*		5
	7		*		01.03.11*	*	*		06.09.11*		2
	15	17.02.11*	*		*			*			1
4	3	03.03.11* 17.05.11	17.05.11* 21.12.10*	02.06.11*	17.05.11 21.12.10	17.05.11	17.05.11* 21.12.10	17.05.11*		02.06.11	12
	10	16.05.11*	*		10.06.11*		01.03.11*	01.03.11*	17.03.11		5
5	5	07.06.11	*	10.06.11* 30.05.11	10.06.11* 09.01.11	10.06.11*	10.06.11* 09.01.11				8
6	13	07.06.11*	07.06.11*	*	09.01.11* 07.06.11			07.06.11 03.06.11	07.06.11		7
7	14	*	*	*	*			15.06.11*			1
											70

Appendix 22. Course documentation Reflective Practitioner Handbook

2010/11

Rationale

Reflection can be interpreted in many different ways but for the purposes of this journal the definition we propose is summed up by Sewell (2008:40).

"I would like you to think of reflection as involving a thoughtful examination of your own practice, based on your analysis of the successful practice of others, and research findings, including your own research in your own classrooms."

This means that reflection involves more than just thinking about teaching. It is about how you analyse your practice, either at a professional level (drawing on school and government policy documents and professional literature – eg 'how to teach' books) or at a 'masters' level (relating your practice to core educational theory and published research findings). You must remember that this is therefore an active process and that you are responsible for your own learning, shaping your own progress and development. The PPGCE course is not something that happens to you. It is a course that requires your full participation in all areas of the course – university aspects and placement-based.

This handbook has been developed to encourage you to participate in the process of reflection. It will prompt and guide you to reflect on those aspects of learning that are critical to your own development. There should be close links between those areas identified as targets following observations, or areas needing to be addressed in the whole school context, and the Q standards, and academic and/or personal goals.

Throughout your PGCE course in addition to practising the art of teaching, you will be required to:

- attend lectures
- take part in seminars, workshop sessions, tutorials and complete others tasks
- carry out activities within school
- read educational literature
- analyse your own practice

You will need to engage in the various aspects of the course in a very active way, reflecting quite carefully on each experience in order to inform your thinking, future planning and practice. You must keep a record (The Reflective Journal webfolio) which will contain:

- specified tasks/activities
- information related to tasks/activities undertaken
- reflections on your own learning and development

The course has been carefully planned in order that you gain the maximum benefit from all aspects and so that each part supports and complements your reflection and learning. In most weeks there are tasks to undertake in school some of which will follow up or prepare you for lectures and seminars. It is by comparing and contrasting both the practical and theoretical aspects that you will gain most insight into the process of learning and teaching and develop academic and professional skills.

The purpose of the University sessions e.g. PVPB lectures, seminars and workshops, learning and teaching sessions, offer an opportunity to share experiences and ideas with other students and relate practice to theory and theory to practice. The tasks provide the opportunity for you to reflect on the issues and provide evidence of the linkage between theory and practice and the QTS standards.

Appendix 23. Student Main Study Content Analysis of Reflective Writing – masters Elements

	Student 1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8	Student 9	Student 10	Student 11	Student 12	Student 13	Student 14	Student 15	Student 16	Student 17	**Total**
Personal Philosophy																		
own learning style	3	0	0	0	12	0	0	0	0	0	0	0	0	1	0	0	0	16
own misconception of issue	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	7
realisation what it means/reference to lack of understanding	3	0	10	5	0	0	1	2	5	2	0	1	2	0	2	4	8	45
what good teachers do	1	1	2	1	2	4	2	5	2	3	0	1	0	0	0	0	1	25
what excellent teachers do	0	0	0	0	0	0	0	2	11	1	0	0	0	1	0	0	0	15
own opinion on how it can happen	7	12	9	7	60	15	11	18	12	12	0	3	18	10	6	11	5	216
How to implement in school	5	0	13	6	7	6	5	5	9	5	0	3	14	0	8	2	7	95
importance of meeting needs of all	4	4	6	1	20	9	2	9	9	7	0	1	5	3	8	4	6	98
how to ensure it happens, what needs to do done (generalisation)	9	5	20	3	31	9	9	26	18	10	0	2	12	14	0	16	2	186
Personal Philosophy TOTAL	35	22	61	23	132	43	30	67	66	40	0	11	51	29	24	38	31	703
School Practice																		

criticism of current placement	1	0	2	2	2	3	0	4	8	1	0	0	1	1	2	3	1	31
reference to own teaching experience this is what I did	15	3	1	21	3	5	4	19	24	14	5	6	8	14	2	23	19	186
asking other professionals/seeking help from others	0	0	1	0	0	0	0	0	6	2	0	0	0	0	0	1	5	15
description of what school does (policy)	15	10	7	3	10	28	8	13	16	9	0	8	12	8	0	11	4	162
comment re impact on school of doing this	0	2	0	1	0	4	0	8	6	1	0	2	0	4	4	2	0	34
School Practice TOTAL	31	15	11	27	15	40	12	44	60	27	5	16	21	27	8	40	29	428
What Literature Says																		
Defines Terms - this is what it means	4	5	5	4	6	5	6	4	4	5	0	6	5	3	8	7	3	80
Literature what is says you should do	46	24	31	15	19	35	27	13	21	29	1	16	18	7	36	29	21	388
criticism of literature	1	0	0	0	0	4	1	0	0	3	0	0	0	2	0	1	8	20
What Literature Says TOTAL	51	29	36	19	25	44	34	17	25	37	1	22	23	12	44	37	32	488
Development of Thinking																		
viewed only	9	0	0	8	1	3	0	2	7	2	0	4	0	3	1	14	9	63
adds questions	2	0	12	19	0	1	0	2	0	2	6	1	2	0	1	7	5	60
Refers to lectures	0	0	2	6	0	1	0	0	0	0	3	2	0	0	0	6	6	26
adds quotes	2	0	8	135	1	15	0	1	2	0	14	4	0	0	1	17	43	243
adds hyperlink	8	3	3	6	0	0	1	0	7	20	0	5	1	1	2	5	3	65
adds sub headings	0	0	8	3	0	1	0	1	2	0	6	0	0	0	1	2	0	24
introduction	9	6	8	6	6	9	3	9	3	10	0	8	13	5	9	6	8	118

Developing Thinking TOTAL	30	9	41	183	8	30	4	15	21	34	29	24	16	9	15	57	74	599
Reflection on Reading																		
literature no link	12	9	18	6	39	16	35	15	16	6	0	8	20	12	79	14	27	332
reflecting on literature	6	0	0	0	5	0	0	0	0	4	0	0	0	0	1	2	0	18
literature and theory discussed	4	2	1	5	9	4	0	2	3	7	0	3	7	7	29	4	5	92
literature linked to practise description	31	19	28	20	14	38	20	22	40	15	0	19	20	18	22	26	30	382
reference to Standards	8	0	2	0	0	0	0	0	11	1	0	0	6	0	2	3	0	33
lit/practise/what will do as result	11	2	2	23	7	0	1	8	9	30	3	16	4	4	4	11	7	142
Reflection on Reading TOTAL	72	32	51	54	74	58	56	47	79	63	3	46	57	41	137	60	69	999
TOTAL	219	107	200	306	254	215	136	190	251	201	38	119	168	118	228	232	235	3217

Appendix 24. Students levels of reflection mapped to context coding, Hatton and Smith framework and Course Taxonomy

Context Coding - of reflective practice	Course Taxonomy Reflective Stage	Taxonomy Level of Study	Taxonomy - Description	Hatton and Smith Framework - Type of Reflection	Hatton and Smith Framework
Personal Philosophy					
Own learning style	Initiate/Reporting/Technical	1	Anecdotal description of personal learning activities or observations.	Descriptive	Description of events that occurred/report of literature. No attempt to provide reasons/justifications for events
Own misconception of issue	Novice/Responding/ Descriptive	1/2	Demonstrate changes in learning and demonstrate some ability to structure thoughts. Comparisons against criteria.	Descriptive Reflection	Reflective, not only a description of events but some attempt to provide reason justification for events or actions but in a reportive or descriptive way. For example "I chose this problem-solving activity because I believe that students should be active rather than passive learners"
Realisation of what it means/reference to lack of understanding	Emergent/Relating. Dialogic	2	Identifies something they are good at, something they need to improve, a mistake they have made, or an area in which they have learnt from their practical experience.	Descriptive Reflection	Reflective, not only a description of events but some attempt to provide reason justification for events or actions but in a reportive or descriptive way. For example "I chose this problem-solving activity because I believe that students should be active rather than passive learners"
What good teachers do	Emergent/Relating/ Dialogic	2	Rationalising and adapting observations in the light of personal or vicarious experiences.	Descriptive Reflection	Reflective, not only a description of events but some attempt to provide reason justification for events or actions but in a reportive or descriptive way. For example "I chose this problem-solving activity because I believe that students should be active rather than passive learners"
What excellent teachers do	Emergent/Relating/ Dialogic	2	Rationalising and adapting observations in the light of personal or vicarious experiences.	Descriptive Reflection	Reflective, not only a description of events but some attempt to provide reason justification for events or actions but in a reportive or descriptive way. For example "I chose this problem-solving activity because I believe that students should be active rather than passive learners"

Own opinion on how to ensure good practice is adopted	Emergent/Relating/ Dialogic	2	Attempts to provide reasons, based on personal judgement or reading of literature. A form of discourse with one's self, an exploration of possible reasons.	Descriptive Reflection	Reflective, not only a description of events but some attempt to provide reason justification for events or actions but in a reportive or descriptive way. For example "I chose this problem-solving activity because I believe that students should be active rather than passive learners"
How to implement in school	Emergent/Relating/ Dialogic	2	A form of discourse with one's self, an exploration of possible reasons. Selection of relevant material to make meaning of learning.	Descriptive Reflection	Reflective, not only a description of events but some attempt to provide reason justification for events or actions but in a reportive or descriptive way. For example "I chose this problem-solving activity because I believe that students should be active rather than passive learners"
Importance of meeting needs of all	Emergent/Relating/ Dialogic	2	Attempts to provide reasons, based on personal judgement or reading of literature. A form of discourse with one's self, an exploration of possible reasons.	Descriptive Reflection	Reflective, not only a description of events but some attempt to provide reason justification for events or actions but in a reportive or descriptive way. For example "I chose this problem-solving activity because I believe that students should be active rather than passive learners"
How to ensure it happens, strive to do	Adaptive/Reasoning /Critical	2/3	Providing rationale for observations or actions on the basis of past experience, theory and philosophy	Dialogic Reflection	Demonstrates a "stepping back" from the events/actions leading to a different level of mulling about, discourse with self and exploring the experience, events, and actions using qualities of judgements and possible alternatives for explaining and hypothesising.
School Practice					
Questioning of practice in current placement	Novice/Responding/ Technical	1/2	Uses sources in some way with a few changes to original ideas or concepts.	Descriptive Reflection	Reflective, not only a description of events but some attempt to provide reason justification for events or actions but in a reportive or descriptive way. For example "I chose this problem-solving activity because I believe that students should be active rather than passive learners"
Reference to own teaching experience	Novice/Responding/ Technical	1/2	Makes an observation or judgement without making any further inferences or detailing the reasons for judgement.	Descriptive Reflection	Reflective, not only a description of events but some attempt to provide reason justification for events or actions but in a reportive or descriptive way. For example "I chose this problem-solving activity because I believe that students should be active rather than passive learners"

Asking other professionals/seeking help from others	Emergent/Relating/ Dialogic	2	Attempts to provide reasons, based on personal judgement or reading of literature. A form of discourse with one's self, an exploration of possible reasons.	Descriptive Reflection	Reflective, not only a description of events but some attempt to provide reason justification for events or actions but in a reportive or descriptive way. For example "I chose this problem-solving activity because I believe that students should be active rather than passive learners"
What school policy says	Emergent/Relating/ Dialogic	2	Identifies aspects of the information which have personal meaning or which connect with their prior or current experience. Recognises relationships between ideas.	Descriptive Reflection	Reflective, not only a description of events but some attempt to provide reason justification for events or actions but in a reportive or descriptive way. For example "I chose this problem-solving activity because I believe that students should be active rather than passive learners"
Comment re impact on school of doing this	Adaptive/Reasoning /Critical	2/3	Clear evidence of critical judgement in selecting, ordering and analysing content to make meaning	Dialogic Reflection	Demonstrates a "stepping back" from the events/actions leading to a different level of mulling about, discourse with self and exploring the experience, events, and actions using qualities of judgements and possible alternatives for explaining and hypothesising.
What Literature Says					
Defining terms	Initiate/Reporting/T echnical	1	Reports event or literature, not reflective at all.	Descriptive	Description of events that occurred/report of literature. No attempt to provide reasons/justifications for events
Literature what you should do	Initiate/Reporting/T echnical	1	Reports event or literature, not reflective at all.	Descriptive	Description of events that occurred/report of literature. No attempt to provide reasons/justifications for events
Questioning what literature says (critique)	Adaptive/Reasoning /Critical	2/3	Explores or analyses a concept, event or experience, asks questions and looks for answers, considers alternatives or hypothesises about why something has happened.	Dialogic Reflection	Demonstrates a "stepping back" from the events/actions leading to a different level of mulling about, discourse with self and exploring the experience, events, and actions using qualities of judgements and possible alternatives for explaining and hypothesising.
Development of thinking					
viewed only					
adds questions to answer	Novice/Responding/ Descriptive	1/2	Makes an observation or judgement without making any further inferences or detailing the reasons for judgement	Descriptive	Description of events that occurred/report of literature. No attempt to provide reasons/justifications for events

notes from lectures	Novice/Responding/ Descriptive	1/2	Demonstrate changes in learning and demonstrate some ability to structure thoughts. Comparisons against criteria.	Descriptive	Description of events that occurred/report of literature. No attempt to provide reasons/justifications for events
adds quotes	Novice/Responding/ Descriptive	1/2	Uses sources in some way with a few changes to original ideas or concepts.	Descriptive	Description of events that occurred/report of literature. No attempt to provide reasons/justifications for events
adds hyperlink	Emergent/Relating/ Dialogic	2	A form of discourse with one's self, an exploration of possible reasons. Selection of relevant material to make meaning of learning.	Descriptive Reflection	Reflective, not only a description of events but some attempt to provide reason justification for events or actions but in a reportive or descriptive way. For example "I chose this problem-solving activity because I believe that students should be active rather than passive learners"
adds list of sub-headings	Emergent/Relating/ Dialogic	2	A form of discourse with one's self, an exploration of possible reasons. Selection of relevant material to make meaning of learning.	Dialogic Reflection	Demonstrates a "stepping back" from the events/actions leading to a different level of mulling about, discourse with self and exploring the experience, events, and actions using qualities of judgements and possible alternatives for explaining and hypothesising.
introduction what I am writing about	Adaptive.Reasoning /Critical	2/3	Providing rationale for observations or actions on the basis of past experience, theory and philosophy. Evidence of emergent meta-cognitive practice. Integrating the information into an appropriate relationship, eg with theoretical concepts, personal experience, involving transformation and conceptualisation.	Dialogic Reflection	Demonstrates a "stepping back" from the events/actions leading to a different level of mulling about, discourse with self and exploring the experience, events, and actions using qualities of judgements and possible alternatives for explaining and hypothesising.
Reflection on Reading					
Literature no link to theory/experience/policy	Initiate/Reporting/T echnical	1	Reports event or literature, not reflective at all.	Descriptive	Description of events that occurred/report of literature. No attempt to provide reasons/justifications for events
Reflects on literature	Emergent/Relating/ Dialogic	2	Identifies aspects of the information which have personal meaning or which connect with their prior or current experience.	Descriptive Reflection	Demonstrates a "stepping back" from the events/actions leading to a different level of mulling about, discourse with self and exploring the experience, events, and actions using qualities of judgements and possible alternatives for explaining and hypothesising.
Literature and theory discussed	Emergent/Relating/ Dialogic	2	Identifies aspects of the information which have personal meaning or which connect with their prior or current experience.	Descriptive Reflection	Demonstrates a "stepping back" from the events/actions leading to a different level of mulling about, discourse with self and exploring the experience, events, and actions using qualities of judgements and possible alternatives for explaining and hypothesising.

Literature links to experience	Adaptive/Reasoning /Critical	2/3	Explores or analyses a concept, event or experience, asks questions and looks for answers, considers alternatives or hypothesises about why something has happened. Explore the relationship between theory and practice in some depth. Clear evidence of critical judgement in selecting, ordering and analysing content to make meaning.	Descriptive Reflection	Demonstrates a "stepping back" from the events/actions leading to a different level of mulling about, discourse with self and exploring the experience, events, and actions using qualities of judgements and possible alternatives for explaining and hypothesising.
Literature linked to experience and Teaching Standards	Autonomous/Reconstructing	M	Extracts and internalises the personal significance of their learning and/or plan their own future learning on the basis of their reflections. Involving reason giving for decisions or events which takes account of the broader historical, social and/or political contexts.	Critical Reflection	Demonstrates awareness that actions and events are not only located in, and explicable by, reference to multiple perspectives but are located in, and influenced by multiple historical and socio-political contexts.
Literature, theory, policy, experience discussed what will do as a result	Autonomous/Reconstructing	M	Clear evidence of critical judgement in selecting, ordering and analysing content to make meaning.	Critical Reflection	Demonstrates awareness that actions and events are not only located in, and explicable by, reference to multiple perspectives but are located in, and influenced by multiple historical and socio-political contexts.

References

Association for Learning Technology (2009) 'LEAP2A: A specification for e-portfolio portability and interoperability' available at http://newsweaver.co.uk/alt/e_article001402921.cfm (accessed 26.10.09)

Alexander, S., Hedberg, J. (1994) 'Evaluating technology-based learning: which model?' In Beattie, K., McNaught, C., Wills, C., (Eds), *Multimedia in education: design for change in teaching and learning* (pp. 233–244). Amsterdam: Elsevier.

Alterio, M. (2004) 'Collaborative journalling as a professional development tool' *Journal of Further and Higher Education* 38(3), pp 321-332

Arap, B. (2007) 'The use of electronic portfolio in initial language teacher training as assessment and evaluation tool' European Institute for e-Learning available at http://www.eife-l.org/publications/eportfolio/proceedings2/ep2007/proceedings-pdf-doc/eportfolio-2007.pdf#page=115 (accessed on 26.10.09)

Archer, Margaret Scotford, ed. (2010) 'Conversations about reflexivity. Ontological explorations' Routledge, London

Ashby, P., Hobson, A., Tracey, L., Malderez, A., Tomlinson, P., Roper, T., Chambers, G., Healy, J. (2008) 'Beginner Teachers' Experiences of Initial Teacher Preparation, Induction and Early Professional Development: A review of literature' Research Report DCSF-RW076 assessed on 03.01.13 available at www.education.gov.uk/publications/.../DCSF-RW076.pdf

Avraamidou, L., Zembal-Saul, C. (2006). 'Exploring the Influence of Web-Based Portfolio Development on Learning to Teach Elementary Science'. *AACE Journal*, 14(2), pp 178-205

Bain, J., Mills, C. (2002) 'Developing Reflection on Practice Through Journal Writing: impacts of variations in the focus and level of feedback' *Teachers and Teaching: theory and practice*, 8(2), pp 171-196

Bangert, A.W. (2004) 'The Seven Principles of Good Practice: A Framework for Evaluating On-Line Teaching' *The Internet and Higher Education*, 7(3), pp 217-232

Banister, S., Vannatta, R.A., Ross, C. (2006) 'Testing Electronic Portfolio Systems in a teacher education: Finding the fight fit' *Action in teacher Education*, 27(4), pp 81-90

Banister, P., Burman, E., Parker, I., Taylor, M. and Tindall, C. (1994) 'Qualitative Methods in Psychology: A Research Guide' Buckingham: Open University Press

Bartlett, A., Sherry, A. (2006) 'Two Views of Electronic Portfolios in Teacher Education: Non-Technology Undergraduates and Technology Graduate Students' *International Journal of Instructional Media*, 33(3), pp 245-253

Barrett, H. (2004) 'Dr Helen Barretts's electronic portfolios' available at http://electronic portfolios.com (accessed on 27.09.12)

Barrett, H. (2006) 'Using Electronic Portfolios for Classroom Assessment' *Connected Newsletter,* 13(2), pp 4-6

Barrett, H. (2007) 'Researching electronic portfolios and learner engagement: The REFLECT Initiative' *Journal of Adolescent and Adult Literacy* 50(8), pp 438-449

Bassey, J (2003) 'Case Study Rsearch' in eds Swainn, J., Pratt, J. 'Educational Research in Practice: making sense of Methodology' London: Continuum

Baston, T. (2010) 'Eportfolios, finally! Campus Technology' available at http://campustechnology.com/articles/2010/04/07/eportfolios-finally.aspx (accessed on 27.09.12)

Bates, A.W. (2005) 2nd 'Technology, E-Learning and Distance Education' London: Routledge

Baxter, P., Jack, S. (2008) 'Qualitative Case Study Methodology' *The Qualitative Report* 13(4) pp 544-599

Becker, R., Jokivirta, L. (2007) 'Online Learning in Universities Selected Data from the 2006 Observatory Survey' London: Observatory on Borderless Higher Educations

BECTA (2003) 'What the Research Tells Us About ICT and Initial Teacher Training' available at http://research.becta.org.uk/upload-dir/downloads/page_documents/research/wtrs_bibs_itt.pdf (accessed on 18.03.08)

BECTA (2007) 'Impact Study of E-Portfolios on Learning' available at http://dera.ioe.ac.uk/1469/1/becta_2007_eportfolios_report.pdf (accessed 03.08.11)

BECTA (2009a) 'The ICT Mark' available at http://search.becta.org.uk/search?client=allbecta_frontend&proxystylesheet=allbecta_frontend&returnto=Becta+about+website&returntoid=3&output=xml_no_dtd&site=default_collection&q=ICT+Mark (accessed 01.10.10)

BECTA (2009b) 'About BECTA' available at http://about.becta.org.uk/display.cfm?page=2075 (accessed 20.01.10)

BECTA (2010) 'TDA E-portfolio Research Bids' available at http://tda.gov.uk/trainee-teacher/support-and-tools/technology-teaching-learning/ict-research.aspx (Accessed 15.01.11)

Beetham, H. (2005) 'e-learning research – emerging issues' *Research in Learning Technology* 13(1), pp 81-89

Bell, J. (2005) 'Doing your research project, 4th edition' Maidenhead: OUP

Bergan, H. (2007) 'ePortfolio in teacher education: A love-hate relationship'. Proceedings of society for Information Technology and Teacher Education International conference 2007 pp 190-915

Biggs, J. (1999) 'Teaching for Quality Learning at University' Buckingham: Society for Research in Higher Education and Open University Press

Black, P., Plowright, P. (2010) 'A multi-dimension model of reflective learning for professional development' *Reflective Practice* 11(11), pp 245-259

Bogdan, R., Biklen, S. (1982) 'Qualitative Research for Education', in J. Wellington (2000) 'Education Research: Contemporary Issues and Practical Research' London: Continuum

Bolton, G. (2012) 'Reflective Practice Writing and Professional Development;' London: Sage

Boulton, H., Hramiak, A. (2012) 'E-flection: the development of reflective communities of learning for trainee teachers through the use of shared online web logs' *Reflective Practice* 13(4), pp 513-515

Boud, D., Keogh R,Walker, D 1985 'Reflection: Turning experience into Learning' London:Kogan

Bourdieu, P. (1989) 'Towards a reflexive sociology: A workshop with Pierre Bourdieu' *Sociological Theory* 7(2) pp 26-36

Blin, F., Munro, M. (2008) 'Why hasn't technology disrupted academics' teaching practices? Understanding resistance to change through the lens of activity theory' *Computers and Education* 50(2), pp 475-490

British Educational Research Association (2004) 'Revised Ethical Guidelines for Educational Research' Nottingham: BERA

British Eductional Research Asociation (2013) 'Research and Teacher Education: the BERA Inquiry' available at http://www.bera.ac.uk/system/files/BERA%20Research%20%20Teacher%20Education%20Inquiry%20%20-%20Outline%20%20initial%20briefing%20paper.pdf

Bruner, E. (1986) 'Ethnography as Narrative', in V. Turner and E. Bruner (eds) The Anthropology of Experience. Chicago: University of Illinois Press.

Bruner, J.S. (1985) 'Vygotsky: a historical and conceptual perspective', in J.V. Wertsch (ed.) *Culture, Communication and Cognition : Vygotskian perspectives.* Cambridge, Cambridge University Press

Bruner, J.S. (1009) 'Acts of Meaning' USA: Harvard University Press

Buckridge, M. (2008) 'Teaching Portfolios. Their role in teaching and learning policy' *International Journal for Academic Development* 13(2), pp 117-127

Burton, N., Brundrett, M., Jones, M. (2008) 'Doing your Education Research Project' London:Sage

Burton, N. (2007) 'The Research Process', in Zwozdiak-Myers (ed) 'Childhood and Youth Studies Exeter:Learning Matters

Butler, D., Novak, H, Jarvis-Selinger, S., Bechingham, B. (2004) 'Collaboration and self-regulation in teachers' professional development' *Teaching and Teacher Education* 20 pp 435-455

Buzzetto-Moore, N. (2010) 'Assessing the Efficacy and Effectiveness of an E-Portfolio Used for Summative Assessment' *Interdisciplinary Journal of E-Learning and Learning Objects* 6, pp 61 – 85

Cambridge, B., Cambridge, D. (2003) 'The future of electronic portfolio technology: supporting what we know about learning' ePortfolio 2003. Poitiers, France available at http://www.eife-l.org/publications/eportfolio/proceedings2/ep2003/Delegate%20Pack.pdf (accessed 06.07.10)

Cambridge, D (2010). 'E-portfolios for Lifelong Learning and Assessment' San Francisco:Wiley

Caracelli, J., Greene, J. (1993) ''Data analysis strategies for mixed-methods evaluation designs' *Educational Evaluation and Policy Analysis* 15 pp 195-207

Carney, J. (2002) 'Campfires around which we tell our stories: Confronting the dilemmas of teacher portfolios and new technologies' available at www.helenbarrett.com/campfires.htm (accessed 28.10.12)

Carnine, D. (1995) 'Trustworthiness, Usability and Accessibility in Educational Research' *Journal of Behaviour Education*' 5(3) pp251-258

Chappell, C., Gonczi, A., Hager, P. (2000) 'Competency-based education', in Foley, G. (Ed) *Understanding Adult Education and Training* 2nd edition pp 191-205

Charmaz, K. (2006) 'Constructing Grounded Theory: A practical guide to qualitative analysis' London: Sage

Cho, Y.J., Brown, G. (2007) 'Exploring Faculty Perceptions of ePortfolios Use and its Relationship to Faculty Teaching Beliefs.' Inter/National Coalition for Electronic Portfolio research: Final Report from Washington State University July 2007

Clarke, D., and H. Hollingsworth. 2002. Elaborating a model of teacher professional growth. Teaching and Teacher Education 18, no. 8: 947–67

Cohen, V.L. (2005) 'Electronic-Portfoilios as Cognitive Tools in a Teacher Education Program' Recent Research Developments in Learning Technologies available at www.formatex.org/micte2005 (accessed 18.03.08)

Cohen, L, Manion, L, and Morrison K (1996) 4th ed '*A Guide to Teaching Practice'* London: Routledge

Cohen, L., Manion, L., Morrison, K. (2011) 'Research methods in education' 7th ed. London:Routledge

Condie, R., Simpson, M., Payne, F., Gray, D. (2002) 'The Impact of ICT Initiatives on Scottish Schools' Glasgow: University of Strathclyde

Conlon, T (2004) 'A Failure of Delivery: the United Kingdom's New Opportunities Fund programme of teacher training in information and communications technology' *Journal of In-Service Education'* 30(1), pp 115-140

Cotterill, S.J, Alton, J.F., Bradley, P.H, Hammond, G.R., MacDonald, A., Struthers, J., Whitens, S. (2006) 'A flexible component-based e-portfolio' in Jafari, A., Kaufman, C. (2006) '*Handbook of Research on ePortfolios'* London: Idea Group

Cotterill, S., Darby, J., Rees Jones, P., Roberts, G., van Tartwijk, J.,Veugelers, M. (2004a) 'ePortfolios and Digital Repositories' ALT-Surf Seminar, Edinburgh [Online] available at: http://www.alt.ac.uk/docs/ALT-SURFseminar_April_2004.pdf (accessed 20.08.08)

Cotterill, S., McDonald, R.T., Drummond, P., Hammond, G. (2004b) 'Design implementation and evaluation of a 'generic' ePortfolio: The Newcastle Experience' paper presented at the eportfolio 2004 conference in Le Rochelle available at www.eife-l.org/publications/**eportfolio**/.../ep**2004**/pap/eP**2004**proceedings (accessed 09.03.11)

Cunliffe, A. (2002) 'Reflexive inquiry in organisational research: Questions and possibilities' *Human Relations* 56(9) pp983-1003

Creme, P. (2005) 'Should student learning journals be assessed? *Arts and Humanities in Higher Education* 30(3), pp 287-296

Creswell, J. (2003) 'Research Design: Qualitative, Quantitative and Mixed Method Approaches' 2nd edition London: Sage

Creswell, J., Clark, V. (2011) 'Designing and conduction mixed methods research' London:Sage

Christie, D., M. Donoghue, G. Kirk, O. McNamara, I. Menter, G. Moss, J. Noble-Rogers, A. Oancea, C. Rogers, P. Thomson, and G. Whitty. 2012. Prospects for Education Research in Education Departments in Higher Education Institutions in the UK. Report from the BERA-UCET Working Group on Education Research

Davies, A., Smith, K. (2006) 'Drivers and Barriers to the Uptake of Learning Technologies: Staff Experiences in a Research-Led University' in O'Donoghue, J.O. (2006) '*Technology Supported Learning and Teaching – A Staff Perspective'* London: INFOSCL Publishing

Dearing, R. (1997) 'National Inquiry of the Committee into Higher Education' London: HMSO

Den Doolvan, P., Kirschner, P. (2003) 'Integrating the educative functions of information and communications technology (ICT) in teachers' and learners' toolboxes: a reflection on pedagogical benchmarks for ICT in teacher education'. *Technology, Pedagogy and Education,* 12(1), pp 161-179

Dewey, J. (1933) *'How we think: A restatement of the relation of reflective thinking in the education process'* Boston: DC Heath and Company

Department for Children, Schools and Families (2008) 'Every Child Matters Green Paper' London: The Stationery Office available at: http://www.dcsf.gov.uk/everychildmatters/about/aims/outcomes/outcomescyp/ (accessed: 20 November 2010)

Department for Education (2012) 'ICT Programme of Study' available at http://www.education.gov.uk/schools/teachingandlearning/curriculum/primary/b00199028/ict (accessed on 01.12.12)

Department for Education and Skills (1999) 'Survey of Information and Communications Technology in schools 1999' HMSO: Norwich

Department for Education and Skills (2002) 'IMPACT2' NGfL Research and Evaluation Series. London: HMSO

Department for Education and Skills (2003a) 'Survey of Information Communication and Technology in Schools 2003'available at http://www.dcsf.gov.uk/rsgateway/DB/SBU/b000421/bweb05-2003.pdf (accessed 18.03.10)

Department for Education and Skills (2003b) 'Towards a Unified e-Learning Strategy' Nottingham:
HMSO

DfES Publications available at http://www.dfes.gov.uk/publications/e-strategy (accessed on 18.03.10)

Department for Education (1992) 'Initial Teacher Training '(Circular 9/92) London:DfE

Department for Education and Employment (1997) 'Standards for Newly Qualified Teachers' (Circular 10/97) London:DfEE

Department for Education and Skills (2002) 'Qualifying to Teach: Professional Standards for Qualified Teacher Status and Requirements for Initial Teacher Training' London: DfES

Department for Education and Skills (2005) 'Harnessing Technology: Transforming Learning and Children's Services' available at https://www.education.gov.uk/publications/eOrderingDownload/1437-2005PDF-EN-01.pdf (accessed on 01.12.11)

Department for Education (2010) 'The Importance of Teaching' (White Paper), London: DfE

Department for Education (2013) 'Teachers' Standards' available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/208682/Teachers__Standards_2013.pdf accessed on 27.08.13

Denscombe, M. (1998) 'The Good Research Guide for Small-scale Social Research Projects' Buckingham: Open University Press

DeVault, M.L. (1997) 'Personal Writing in Social Science: Issues of Production and Implementation', in R. Hertz (ed.) Reflexivity and Voice. Thousand Oaks, CA: Sage

Drent ,M., Meellissen, M. (2007) 'Which Factors obstruct or stimulate teacher educators to use ICT innovatively'*? Computers and Education*, 51, pp 187-199

Duffy, T.M., Cunningham, D.J. (1996) 'Constructivism: Implications for the design and delivery of instruction' Handbook for Research for Edu.Comm and Tech.' New York: Routledge Falmer

Duffy, K., Anthony, D., Vickers, F. (2008) 'Are e-portfolios an asset to learning and placement?' De Montford University, Leicester available at https://www.dora.dmu.ac.uk/bitstream/handle/2086/3643/AreE-PortfoliosAnAssetToLearningandPlacement-ASETandDMUReport-March2008_001.pdf?sequence=1 (accessed 10.08.11)

Dymoke, S., Harrison, J. (2008) 'Reflective Teaching and Learning' London: Sage

Ellis, C., & Bochner, A. P. (2000). Autoethnography, personal narrative, reflexivity: Researcher as subject. In N. K. Denzin & Y. S. Lincoln (Eds.), Handbook of qualitative research (2nd ed., pp. 733-768). Thousand Oaks, CA: Sage

Eraut, C. (1994) 'Developing Professional Knowledge and Competence' Lewes: Falmer Press

Evans, E., Powell, M. (2007) 'Conceptual and practical issues related to the design for and sustainability of communities of practice: the case of e-portfolio use in preservice teacher training' *Technology, Pedagogy and Education*, 16(2), pp 199-214

Evans, K., Hodkinson, P., Rainbird, H., Unwin, L. (2006) 'Improving Workplace Learning' London: Routledge

Ezzy, D. (2002) 'Qualitative Analysis: Practice and Innovation' London: Routledge

Felce, A., Purnell, E. (2010) 'Developing an e-portfolio pedagogy for small and medium sized enterprises' available at http://www.pebblepad.co.uk/pp2010/cs01.pdf (accessed 18.08.11)

Fiedler, R., Mullen, L., Finnegan, M. (2009) 'Portfolios in context: A comparative study in two preservice teacher education programs' *Journal of Research on Technology in Education* 42(2), pp 99-122

Finlay, L. (2002) 'Negotiating the swamp: the opportunity and challenge of reflexivity in research practice' *Qualitative Research* 2(2) pp 209-230

Fook, J. (2002) 'Social work: Critical theory and practice' London: Sage

Francis, D. (1997) 'Critical Incident Analysis: a strategy for developing reflective practice' *Teachers and Teaching: theory and practice*. 3(2), pp 169-18

Francis, D., Ingram-Stausss, L. (2005) 'The labour of learning to reflect' *Teachers and Teaching: theory and practice* 11(6), pp 541-523

Freiberg, J., Waxman, H. (1990) 'Reflection and the Acquisition of Technical Teaching Skills' In Cliff, R., Houston, R., Pugach, M. (Eds.), *Encouraging Reflective Practice in Education* London: Teachers College Press

Fullan, M. (2007) 4rd edition 'The new meaning of educational change' New York: Teachers College Press

Furlong, J., Barton, L., Miles, S., Whiting, C., Whitty, G. (2000) 'Teacher Education in Transition – re-forming professionalism?' Buckingham:OUP

Furlong, J. (2005) 'New Labout and teacher education: the end of an era?' *Oxford Review of Education*, 31(1) pp 119-134

Gaitán, A., Manton, R., Jankowska, M. (2007) 'Piloting eportfolios at the University of Bedfordshire Final Report' available online http://www.beds.ac.uk/bridgescetl/through/e-portfolios/pilotingeportfolios.pdf (accessed on 02.10.10)

Gaitan, A. (2012) 'Understanding students' experiences of e-PDP and the factors that shape their attitudes' *International Journal of ePortfolios* 1 pp 29-38

Gallagher, P. (2001) 'An evaluation of a standards based portfolio' *Nurse Education Today*, 21(5), pp 409-16

Gathercoal, P., Love, D., Bryde, B., McKean, G. (2002)'Web Based Electronic Portfolios' available online http://net.educause.edu/ir/library/pdf/eqm0224.pdf (accessed 02.10.09)

Glaser, B., Strauss, A. (1967) 'The Discovery of Grounded Theory: Strategies for Qualitative Research' New York: Aldine De Gruyter

Glesne, C., & Peshkin, A. (1992). Becoming qualitative researchers: An introduction. White Plains, NY: Longman

Goodyear, P. (2002) 'Psychological foundations for networked learning' In C. Steeples & C. Jones, eds, *Networked Learning: Perspectives and Issues*, pp. 49–75. London: Springer-Verlag.

Gomaz, M., Burda Walker, A., Page ,M. (2000) 'Personal experience as a guide to teaching' *Teaching and Teacher Education* 11, pp 731-747

Gorard, S., Taylor, C. (2004) 'Combining Methods in Educational and Social Research' Maidenhead: OUP

Gray, D.E. (2004) 'Doing research in the real world' London: Sage

Green, H., Hannon, C. (2007) 'Young people are spending their time in a space which adults find difficult to supervise or understand' available at http://www.demos.co.uk/files/Their%20space%20-%20web.pdf (accessed 09.03.11)

Greene, J. C., Caracelli, V. J. (1997). 'Defining and describing the paradigm issue in mixed-method challenges and benefits of integrating diverse paradigms' (pp. 5-17) *New Directions for Evaluation* No. 74 San Francisco: Jossey-Bass

Greene, J., Caracelli, V., Graham, W (1989) 'Towards a conceptual framework for mixed-methods evaluation designs' *Educational Evaluation and Policy Analysis* 11, pp 255-274

Grier, J., Denney, M., Clark, M. (2006) 'A Tale of two Programs – A comparative study of electronic portfolio assessment in teacher education' annual meeting AERA USA April 2006 available at www.litre.ncsu.edu/sltoolkit/**e-portfolio**.html (accessed 09.03.11)

Grimmett, P. (1988) 'The nature of Reflection and Schon's Conception in Perspective' In Grimmett, P., Erickson, G.L. *Reflection in Teacher Education* London: Teachers College Press

Gronlund, N., Linn R. (1990) 'Measurement and Evaluation in Teaching' 6th ed New York: MacMillan Publishing

Gwet, K. (2012) 'Handbook of Inter-Rater Reliability: The definitive guide to measuring the extent of agreement among multiple rates' Gaithersberg, USA:Advanced Analytics

Habermas, J. (1971) 'Knowledge and Human Interests' London: Heinmann

Hackett, S. (2001 'Educating for competency and reflective practice: fostering a conjoint approach to education and training' *Journal of Workplace Learning*, 13(3), pp 103-112

Hafler, J.P. (2011) 'Extraordinary Learning in the Workplace' London: Springer

Hall, G.E., Hord, S.M. (2001) 'Implementing change: patterns, principles, and potholes.' Needham Heights MA: Allyn & Bacon

Hallman, H.L. (2007) 'Negotiating teacher identity: Exploring the use of electronic teaching portfolios with preservice English teachers' *Journal of Adolescent and Adult Literacy*, 50(6), pp 474-485

Hammersley, M., Atkinson, P. (2007) 3rd edition 'Ethnology Principles in Practice 3rd Edition' Abingdon: Routledge

Hargreaves, J. (2004) 'So how do you feel about that? Assessing Reflective Practice' *Nurse Education Today* 24(3), pp196-201

Hartmann, C., Calandra, B. (2007) 'Diffusion and reinvention of eportfolio design practises as a catalyst for teacher learning '*Technology, Pedagogy and Education* 16(1), pp 77-93

Hatton, N., Smith, D. (1995) 'Reflection in Teacher Education: Towards Definition and Implementation' *Teaching and Teacher Education* 11(1), pp 33-49

Haywood, J., Anderson, C., Coyle, H., Day, K., Haywood, D., Macleod, H. (2000) 'Learning Technology in Scottish Higher Education – a survey of the views of senior managers, academic staff and 'experts'' *ALT-J*, 8(2), pp 5-17

HEFCE (2005) 'Enhanced Learning and Teaching Through The use of Technology: A Revised Approach to HEFCE's Policy for E-Learning' online http://www.hefce.ac.uk/pubs/hefce/2009/09_12 (accessed 28.0810)

Heath, M. (2005) 'Are you ready to go digital? The pros and cons of electronic portfolio Development' *Library Media Connection*, 23(7), pp 66-70

Heaton-Shrestha, C., Gipps, C., Edirisingha, P., Linsey, T. (2007)' Learning and e-learning in HE: the relationship between student learning style and VLE use' *Research Papers in Education* vol 22, no 4 pp 443-464

Heck, R.H. (2011) 'Conceptualising and Conduction Meaningful Research Studies in Education' in Hayden, J., Levy, M., Thompson (eds) *The Sage Handbook for Research in Eduction* London: Sage

Henry, P. (2001) 'E-learning technology, content and services' *Education and Training* 43(4), pp 249-255

Henry, G.T. (1990) 'Practical Sampling' Newbury Park CA:Sage

Hermans, R., Tondeur, J., van Braak, J., Valcke, M. (2008) 'The impact of primary school teachers' educational beliefs on the classroom use of computers' *Computers and Education* 51, pp 1499-1509

Hertz, R. (ed.) (1997) 'Reflexivity and Voice' Thousand Oaks, CA: Sage

Hicks, T., Russo, A., Autrey, T., Gardner, R., Kabodian, A., Edington, C. (2007) 'Rethinking the purposes and processed for designing digital portfolios' *International Reading Association* 50(6), pp 450-458

Higgison, C., Currant, N., Murray, C. (2006) 'Learners' experience of using e-portfolios. Interim Evaluation Report' The Enhancing Learner Progression (ELP) project available at www.jisc.ac.uk/uploaded.../ELPProgressReportMarch2006V1.1.doc (accessed on 13.12.12)

Hramiak, A., Boulton, H (2013) "Escalating the use of Web 2.0 Technology in Secondary Schools in the United Kingdom: Barriers and Enablers Beyond Teacher Training" *The Electronic Journal of e-Learning*, 11(2) pp91-100, available at www.ejel.org (accessed on 28.08.13)

Hobbs, V. (2007) 'Faking it or hating it: can reflective practice be forced?' *Reflective Practice* 8(3), pp 405-417

House of Commons, Children, Schools and Families Committee (2010) 'Training of Teachers' Fourth Report of Session 2009-10 available at http://www.publications.parliament.uk/pa/cm200910/cmselect/cmchilsch/275/275i.pdf (accessed on 01.08.13)

Huberman, M., Miles, M. (2002) 'The Qualitative Researchers Companion' London: Sage

Imhof, M., Picard, C. (2009) 'Views on using portfolio in teacher education' *Teaching and Teacher Education* 25 pp 149 – 154

Janssen, F., de Hullu, E., Tigelaar, D. (2008) 'Positive experiences as input for reflection by student teachers' *Teachers and Teaching: theory and practice*, 14(2), pp 115-127

JISC (2008) 'Effective Practice with e-Portfolios Supporting 21st century learning' Bristiol:JISC:

Johnson, B., Christensen, L. (2004) 'Educational Research: Quantitative, Qualitative and Mixed Approaches' London: Pearson

Kathpalia, S.S., Heath, C. (2008) 'Reflective writing: insights into what lies beneath' *RELC Journal* 39(3), pp 300-317

Kennison, M., Misselwitz, S. (2002). 'Evaluating reflective writing for appropriateness, fairness and consistency.' *Nursing Education Perspectives'* 23(5), pp 238-242

Kimball, M. (2005) 'Database e-portfolio systems: A critical appraisal. Computers and Composition 22(4), pp 434-458

Kirkwood, A. (2009) 'E-Learning: you don't always get what you hope for' *Technology, Pedagogy and Education*. 18(2), pp107-121

Kleinsasser, A. (2000) 'Researchers, Reflexivity, and Good Data: Writing to Unlearn' *Theory into practice* 39(3) pp 155-162

Kobl, D. (1984) 'Experiential Learning as the Science of Learning and Development' Englewood Cliffs NJ:Pentice Hall

Korthagen, F.A.J (1999) 'Linking Reflection and Technical Competence: the logbook as an instrument in teacher education.' *European Journal of Teacher Education*, 22(2/3), pp191-207

Korthagen, F.A.J. (2010) How teacher education can make a difference, *Journal of Education for Teaching: International research and pedagogy*, 36(4), pp407-423

Kozulin, A., Gindis, B., Ageyev, V., Miller, S. (2007) 'Vygotsky's Educational Theory in Cultural Context' New York:Cambridge University Press

Krasna, M., Bratina, T., Kaucic, B. (2007) 'Designing and application of E-portfolio for teacher training' Conference ICL 2007 Sept 26th - 28th available at http://events.eife-l.org/events/2007/icl2007 (accessed 09.03.11)

Kress, G., Pachler, N. (2007) 'Thinking abut the 'm' in m-learning' in Pachler, N (ed) *Mobile learning: towards a research agenda* London: WLE Centre, IoE

Kvale, S. (1996) 'Interviews: An introduction to qualitative research interviews' London:Sage
Winter, G. (2000) 'A Comparative Discussion of the Notion of 'Validity' in Qualitative and Quantitative Research' *The Qualitative Report* 4 (3 & 4) accessed 27.10.13 available at http://www.nova.edu/ssss/QR/QR4-3/winter.html

Juch, B. (1983) 'Personal Development: Theory and Practice in management Training' Chichester:Wiley

Lankshear, C., Knabel, M. (2006) 'A handbook for Teacher Research from design to implementation' Maidenhead:OUP

Lichtman, S. (2006) 'Qualitative Research in Education: A user's guide' Thousand Oaks: Sage

Laurillard, D. (2008) 'Digital technologies and their role in achieving our ambitions for education' available at http://eprints.ioe.ac.uk/628/1/Laurillard2008Digital_technologies.pdf (accessed on 01.12.12)

Laurillard, D., Masterman, E. (2010) 'Online Collaborative TPD for Learning Design' In Lindberg, O., Olofason, A. (2009) 'Online Learning Communitites and Teacher Professional Development: Methods for Improved Education Delivery' Hersley PA: Info Science ref pp 236 – 46

Leitch, R., Day, C. (2000) 'Action research and reflective practice: towards a holistic View' *Educational Action Research* 8(1), pp 179-193

Lindblom-Ylänne, S., Trigwell, K., Nevgo, A., Ashwin, P. (2007) 'How approaches to teaching are affected by discipline and teaching context' *Studies in Higher Education* 31(3), pp 285-296

Lipczynski, K., Young, D. (2007) 'Transferability of e-Portfolios in Education. Scoping study' available at http://dera.ioe.ac.uk/13076/1/6012.pdf (accessed on 13.12.12)

Lorenzo, G., Ittelson, J. (2005) 'Demonstrating and assessing Student Learning with e-portfolios' Educause EL1 Paper 3 available at http://net.educause.edu/ir/library/pdf/ELI3003.pdf (accessed 09.03.11)

Luttenberg, J., Bergen, T. (2008) 'Teacher reflection: the development of a typology' *Teachers and Teaching: theory and practice* 14(5), pp 543-566

Lynch, L., Purnawarman, P. (2004) 'Electronic portfolio assessment in US educational and instructional technology programs: Are they supporting teacher education?' *TechTrends* 48(1), pp 50-56

Lyons, N. (2006) 'Reflective engagement as professional development in the lives of university teachers' *Teachers and Teaching: Theory and Practice* 12(3), pp151-168

McIntyre, L.J. (2005) 'Need to know – social science research methods' Washington State University: McGraw-Hill

MacKinnon, A., Erickson, G. (1988) 'Taking Schon's Ideas to a Science Teaching Practicum' In Grimmett, P., Erickson, G.L. *Reflection in Teacher Education* London: Teachers College Press

McLellon, E. (2004) 'How reflection is the academic essay? *Studies in Higher Education* 29(1) pp76-89

McMullan, M., Endacott, R., Gray, M.A., Jasper, M., Miller, C.M.L., Scholes, J., Webb C. (2003) 'Portfolios and assessment of competence: a review of the literature' *Journal of Advanced Nursing*, 41(3), pp 283-294

McNair, V., Galanouli, D. (2002) 'Information and Communications Technology in Teacher Education: Can a reflective portfolio enhance reflective practice?' *Journal of Information Technology for Teacher Education*, 11(2), pp 181-196

Maddon, T. (2007) 'Supporting Student E-portfolios' Hull: The Higher Education Academy

Madge, C., Meek, J., Wellens, J., Hooley, T. (2009) 'Facebook, social integration and informal learning at university: It is more for socialising and talking to friends about work than for actually doing work' *Learning, Media and Technology*, 34(2), pp 141-155

Mahduzageh, H., Bieman, H., Mulder, M. (2008) 'Determining factors of the used of e-learning environments by university teachers' *Computer and Education* 51(1), pp 142-154

Mair, J.M.M. (1988) 'Psychology as storytelling' *International Journal of Person Construct Psychology*, 1, 125-137

Marcos, J.J.M., Sanchez, E., Tillema, H. (2007) 'Teachers reflecting on their work: articulating what is said about what is done' *Teachers and Teaching: theory and practice*, 14(2), pp 95-114

Mason, R., Pegler, C., Weller, M. (2004) 'e-Portfolios: an assessment tool for online courses' *British Journal of Educational Technology* 35(6**),** pp 717-727

Matthews, B., Ross, L. (2010) 'Research Methods – A guide for Social Sciences' Harlow:Pearson

Mayes, T. (2006) 'Theorectical Perspectives on Interaction in E-Learning' in Juwah, C, *Interactions in online education implications for theory and practice* London: Routledge

Mayes, T.,de Freitas, S. (2004), 'JISC e-Learning Models Desk Study, Stage 2: Review of e-learning theories, frameworks and models' available at www.jisc.ac.uk/uploaded_documents/stage%202%20#learning%20Models%20(Vresion%201).pdf (accessed 05.07.09)

Mayes. T,, de Freitas, S. (2007) 'The Role of Theory' in Beetham, H., Sharpe, R. *Rethinking Pedagogy for a digital age – designing and delivering e-learning* Abingdon: Routledge

Maykut, P., Morehouse, R. (1994) 'Beginning Qualitative Research A Philosophic and Practical Guide' Basingstoke: Falmer

Maxwell, J. A. (1996). Qualitative research design: An interactive approach. Thousand Oaks, CA: Sage

Maxwell, J., Loomis, D., (2003) 'Mixed Methods Design: An alternative Approach' in eds Tashakkori, A., Teddlie, C. (2003) 'Handbook of mixed methods in social and behavioural research' London:Sage

Meara, N. M., & Schmidt, L. D. (1991). The ethics of researching counselling/therapy processes. In C.E. Watkins, Jr., & L.J. Schneider (Eds.), Research in counselling (pp. 237- 259). Hillsdale NJ: Lawrence Erlbaum Associates.

Mee, A. (2008) 'E-learning in initial teacher education: A solution looking for a problem*?'* *Reflection Education*. 4(2), pp 113-126

Meyer, E.J., Abrami, P.C., Wade, A., Scherzer, R. (2012) 'Electronic Portfolios in the Classroom: Factors impacting teachers' integration of new technologies and new pedagogies' *Technology, Pedagogy and Education* 20 (2) pp 191-207

Mezirow, J. (1981) 'A critical theory of adult learning and education' *Adult Education* 32(1), pp 3-24

Moon, J. (1999) ''Learning Journals: A handbook for academics, students and professional development' London: Kogan Page

Moon, J. (2001) 'PDP Working Paper 4: Reflection in Higher Education Learning' LTSN Generic Centre, available at http://www.heacademy.ac.uk/resources/detail/id72_Reflection_in_Higher_Education_Learning (accessed on 05.07.09)

Moon, J. (2004) 'Reflection in Learning and Professional Development' Abingdon: Routledge Falmer

Moon, J. (2005) 'We seek it here: a new perspective on the elusive activity of critical thinking: a theoretical and practical approach' Higher Education Academy: University of Bristol

Moore, A. (2000) 'Teaching and Learning Pedagogy: Curriculum and Culture' London: Routledge Falmer

Moore, A. (2007) 'Beyond reflection: contingency, diosyncrasy and reflexivity in initial teacher education' In Hammersley, M (2007) 'Educational Research and Evidence-based Practice' London: Sage

Mukherji, P., Albon, D. (2010) 'Research Methods in Early Childhood' London: Sage

Murray, C., Smith, A. (2006) 'From application to graduation and beyond:Exploring user engagement with e-portfolios and the e-advantage' *European Journal of Open, Distance of E-learning* available at *http://www.eurodl.org/?p=archives&year=2007&halfyear=1&article=255* (accessed 09.03.11)

Musset, P. (2010) 'Initial Teacher Education and Continuing Training Policies in a Comparative Perspective: Current Practices in OECD Countries and a Literature Review on Potential Effets' OECD Education Working Papers, No. 48, OECD Publishing available at http://dx.doi.org/10.1787/5kmbphh7s47h-en (accessed 01.08.13)

National Association of Advisors for Computers in Education (2006a) 'ICT Mark' available at http://www.naace.co.uk/ictmark (accessed on 18.12.12)

National Association of Advisors for Computers in Education (2006b) 'ICT Mark Self-Review Framework' available at http://www.naace.co.uk/ictmark/srf (accessed on 18.12.12)

Newby, P. (2010) 'Research Methods for Education' Harlow: Pearson

Newnam, I., Lim, J., Pineda, F. (2013) 'Content validity using a mixed methods approach: Its application and Development through the use of a table of specifications methodology' *Journal of Mixed Methods Research* 7(3) pp 243-260.

Ness-Biber, S. (2011) 'Mixed Methods Research: Merging Theory with Practice' New York:Guildford Press

Nisbet, J. and Watt, J. (1984) 'Case Study,' in Bell, K., et al (eds.) Conducting Small-Scale Investigations in Educational Management London: Harper & Row

Nixon, I., Smith, K., Stafford, R., Camm, S. (2006) 'Work-based learning: Illuminating the higher education landscape' HEA. York.

OECD (2011) Lessons from PISA for the United States: strong performers and successful reformers in education available at http://www.oecd.org/dataoecd/32/50/46623978.pdf (accessed on 28.09.13)

Office for Standards in Education (2002) 'ICT in Schools: effect of Government initiatives' London: OFSTED available at http://dera.ioe.ac.uk/10148/1/ICT_in_schools_-effect_of_government_initiatives_(HMI_423).pdf (accessed on 12.12.12)

Office for Standards in Education (2009) 'Improving teachers' subject knowledge across the curriculum – a summary of evidence from subject surveys (excluding English and mathematics) 2007/08' available at http://www.Ofsted.gov.uk/resources/improving-primary-teachers-subject-knowledge-across-curriculum (accessed on 03.03.13)

Office for Standards in Education (2012) 'School Inspection Handbook' available at http://www.Ofsted.gov.uk/resources/school-inspection-handbook (accessed on 31.01.13)

Office for Standards in Education (2013) 'Initial Teacher Education (ITE) Inspection Handbook' published September 2013 Reference No: 120028 available at

http://www.Ofsted.gov.uk/resources/initial-teacher-education-inspection-handbook accessed on 27.08.13

Oliver, P. (2003) 'The Student's Guide to Research Ethics' Maidenhead: OUP

Pachler, N., Daly, C., Mor, Y., Mellar, H. (2009) 'Formative e-assessment: practitioner cases' *Computers and Education* 54(3), pp 715-721

Patton, M.Q. (1990) 'Qualitative Evaluation and Research Methods' Newbury Park CA: Sage

Paulson, F.L., Paulson, P. (1994) "Assessing Portfolios Using the Constructivist Paradigm" in Fogarty, R. (1996) *Student Portfolios*. Palatine: IRI Skylight Training & Publishing

Pavlovich, K., Collins E., Kones, G. (2009) 'Developing students' skills in reflective practise: Design and assessment' *Journal of Management Education* 33, pp 37-58

Peacock, S., Gordon, L., Murray, S,. Morss, K., Dunlop, G. (2009) 'Tutor response to implementing an eportfolio to support learning and personal development in further and higher education institutions in Scotland' *British Journal of Educational Technology* 41(5), pp 827-851

Pecheone, R.L., Pigg, M., Chung, R.R., Souviney, R.J. (2005) 'Performance assessment and electronic portfolios: their effect in teacher learning and education' *The Clearing House*, 78(4), pp 164-76

Penso, S., Shoham, E., Shiloah, N. (2001) 'First steps in novice teachers' reflective activity' *Teacher Development* 5 pp 324-338

Plowwright, D. (2011) 'Using mixed methods: Frameworks for an integrated methodology' London:Sage

Pollard, A. (2002) 'Reflective Teaching: effective and evidence-informed professional practice' London: Continuum

Pollard, A. (ed) (2010) 'Professionalism and Pedagogy: A contemporary opportunity' A Commentary by TLRP and GTCE. London: TLRP

Pollard, A., Collins, S., Maddock, M., Simco, N., Swaffield, S., Warin, J.,Warwick, P. (2005) 2nd ed '*Reflective Teaching'* London: Continuum

Potter, J. and Wetherell, M. (1995) 'Discourse Analysis', in J.A. Smith, R. Harré and L. van Langenhove (eds) Rethinking Methods in Psychology. London: Sage

QAA (2001) 'Guidelines for HE Progress Filesm Quality Assurance Agency for Higher Education' available at http://www.qaa.ac.uk/academicinfrastructure/progressfiles/guidelines/progfile2001.asp (accessed 09.12.09)

Radnor, H (2002) 'Researching your professional practice, doing interpretive research' OUP:Buckingham

Reason, P., Bradbury, K. (2001) 'Handbook of action research, practitioner inquiry and practice' London: Sage

Research University (2009) 'Primary PGCE Primary Professional Development Profile - Reflective Practitioner Handbook 2009/10' (The identity of the participating University has been withheld in accordance with Ethics Committee recommendations)

Research University (2010) 'Primary PGCE Primary Professional Development Profile - Reflective Practitioner Handbook 2010/11' (The identity of the participating University has been withheld in accordance with Ethics Committee recommendations)

Reynolds D, Treharne D, Tripp H (2003) 'ICT – The hopes and the reality' *British Journal of Educational Technology* 34(2), pp 151-167

Richardson, L. (1994) 'Writing: A Method of Inquiry', in N.K. Denzin and Y.S. Lincoln (eds) Handbook of Qualitative Research. Thousand Oaks, CA: Sage

Richert, A. E. (1992) 'Written Cases – A Vehicle for Inquiry into the Teaching Process' In J. Shulman *Case methods in Teacher Education* (pp 155-173). New York: Teacher College Press. (Cap.III)

Ridenour, C., Newman, I. (2008) 'Mixed Methods Research: Exploring the Interactive Continuum' Carondale,IL:Southern Illinois University Press

Roberts, G., W. Aalderink, J., Cook, M., Feijen, J., Harvey, S., Lee, S., Wade, V.P. (2005) 'Reflective learning, future thinking: digital repositories, e-portfolios, informal learning and ubiquitous computing' Briefings from the ALT/SURF/ILTA Spring Conference Research Seminar Trinity College: Dublin. Available at http://www.surf.nl/download/ALT_SURF_ILTA_white_paper_2005%20(2).pdf (accessed 01.10.10)

Robertson, J. (2002) 'The ambiguous embrace: twenty years of IT (ICT) in UK primary schools' *British Journal of Educational Technology* vol 3(4), pp 403-409

Roblyer, M., Knezek, G. (2003) 'New millennium research for educational technology: a call for a national research agenda' *Journal of Research on Technology in Education*, 36(1), pp 60-76

Roderick, R. (1986) ''Habermas and the foundations of critical theory' Basingstoke:Macmillan Publishers

Roper, L., Pettit, J. (2002) 'Development and the Learning Organisation: An Introduction' *Development in Practice* 12(3-4), pp258-271

Ruben, J., Ruben, R.S. (2012) 'Qualitative Interviewing: The Art of Hearing Data' 3rd Ed USA:Sage

Russell T, Munby H (1992) 'Reflective Teacher Education: Technique or Epistemology?' *Teaching and Teacher Education* 9(4), pp 431-438

Ryan, J., Griffin, S. (2010) 'Partnerships with parents' in Arthur, J & Cremin, T (eds) *Learning to Teach in the Primary School*. London: Routledge. pp 439-454

Sapsford, R. Abbott, R (1996) 'Ethics, politics and research' in Sapsford, R, Jupp, V (eds) *Data Collection and Analysis* London: Sage

Sapsford, R., Jupp, V. (1996) 'Data Collection and Analysis' London:Sage

Selwyn, N. (2011) 'The place of technology in the conservation-Liberal Democrat education agenda: an ambition of absence?' *Educational Review*, 63(4), pp 390-408

Sewell, K. (ed) (2008) 'Doing Your PGCE at M Level - A Guide for Students' London: Sage

Schön, D. (1983) 'The Reflective Practitioner: Toward a new design for teaching and learning in the professions' San Francisco: Jossey Bass

Schön, D. (1987) Knowledge and teaching: Foundations of the New Reform. *Harvard Educational Review* 57, pp 1–23

Schwandt, T.A. (1997) 'Quantitative inquiry: A dictionary of terms' Thousand Oaks CA: Sage

Scott, D., Usher, R. (2006) 'Researching Education data, methods and theory in educational enquiry' London: Continuum

Shipman, M (1997) 'The limitations of social research' 4th ed London:Longman

Smith, D. (2102) 'Supporting new teacher development using narrative-based professional learning' *Reflective Practice: International and Multidisciplinary Perspective,* 13(1) pp 149-165

Spilkova, V. (2001) 'Professional Development of Teachers and Student Teachers through Reflection on Practice' *European Journal of Teacher Education,* 24(1), pp 59-65

Standish, P. (1995) 'Post-modernism and the duction of the whole person' *Journal of Philosophy of Education* 20(1) pp 121-36

Stake, R.E. (1995) 'The Art of Case Study Research' London:Sage

Stake , R.E. (1994) 'Case Studies' In Denzin, N.k., Lincoln Y,S (eds) 'Handbook of qualitative research (pp 236-247) Thousand Oaks CA: Sage

Stefani L, Mason R, Pegler C (2007) 'The educational potential of e-portfolios supporting personal development and reflective learning' Abingdon: Routledge

Steffens, K. (2008) 'Technology Enhanced Learning Environments for Self-regulated learning a framework for research' *Technology, Pedagogy and Education* 17(3), pp 221-232

Steier, F. (1991) (Ed.) 'Research and reflexivity' Beverly Hills, CA: Sage

Stemler, S. (2004) 'A comparison of consensus, consistency, and measurement approaches to estimating interrater reliability' *Practical Assessment, Research & Evaluation*, no.9(4). Available at http://PAREonline.net/getvn.asp?v=9&n=4 assessed on 21.06.13

Strudler, N., Wetzel, K. (2005) 'The Diffusion of Electronic Portfolios in Teacher Education: Issues of initiation and Implementation' *Journal of Research on Technology in Education*, 37(4), pp 411-433

Strudler, M. Wetzel, K. (2012) 'Electronic Portfolios in Teacher Education: Forging a Middle Ground' *Journal of Research on Technology in Education* 44(2), pp 161-173
Sutherland, S., Powell, A. (2007), 'CETIS SIG mailing list discussions' available at: https://www.jiscmail.ac.uk/cgi-bin/webadmin?A1=ind0707&L=CETIS-PORTFOLIO#3 (accessed 30.08.12)

Sutherland, S. (2010) 'Strand Theory' In Poot, A (2010) 'Effective Use of PebblePad' Telford: University of Wolverhampton

Sutton, L., Townend, M., Wright, J. (20007) 'The experiences of reflective learning journals by cognitive behavioural psychotherapy students' *Reflective Practice* 8(3), pp 387-404

TDA (2008) 'Research Grants' available as http://www.tda.gov.uk/upload/resources/xls/ict_sucessful_bids.xls (accessed 20.11.08)

TDA (2007) 'Invitation to tender for e-learning grants 2007-08 T34785P' available at http://webarchive.nationalarchives.gov.uk/20101021152907/http:/www.ttrb.ac.uk/ (accessed 07.05.11)

TDA (2010a) 'QTS Guidance' available at www.tda.gov.uk/trainee-teacher/qts-standards.aspx (accessed on 20.10.10)

TDA (2012) 'ICT – QTS Skills Tests' available at http://webarchive.nationalarchives.gov.uk/20120203163341/http://tda.gov.uk/trainee-teacher/qts-skills-tests/ict.aspx (accessed on 31.01.13)

Taber, K (2008) 'Classroom-based Research and Evidence-based Practice: A Guide for Teachers' London: Sage

Teaching Agency (2013) 'Allocations Methodology – Initial Teacher Training Academic Year 2013/14' available at http://media.education.gov.uk/assets/files/pdf/a/allocations%20methodology%20ay2013_14.pdf accessed on 27.08.13

Tashakkori, A., Teddlie, C. (2003) 'Handbook of mixed methods in social and behavioural research' London:Sage

Teddlie, C., Tashakkori, A. (2009) 'Foundations of Mixed Methods Research' Thousand Oaks, CA: Sage

Thomas, S. (1992) 'IT Curriculum Reform: Key dates (Part 2)' ITTE Newsletter Winter 92-93: p 15-18 available at www. l2.cust.educ.ubc.ca/wordpress_edcp/.../07/UK-and-USA-expenditure.pdf (accessed on 09.03.11)

Thompson, V. (2011) 'Finding the funds for ICT' *Education Business available at* http://www.educationbusinessuk.net/features/5/2463-finding-the-funds-for-ict (accessed 31.01.13)

Tillema, H. (2006) 'Constructing knowledge in professional conversations. The role of beliefs on knowledge and knowing' *Learning and Instruction* 16(6) pp592-608

Tosh, D., Light, T.P., Fleming, K., Haywood, J. (2005) 'Engagement with electronic portfolios: Challenges from the student perspective' *Canadian Journal of Learning and Technology*, 31 (3), pp 1-22

Twining, P., McCormack, R. (1999) 'Learning Schools Programme: Technology Competence in the Support of Learning' 10th international conference of the Society for Information Technology and Teacher Education, San Antonio, Texas

Twining, P. (2002) 'ICT in Schools Estimating the level of Investment' available at www.meD8.info/docs/meD8_02-01.pdf (accessed10.02.10)

Valli, L. (1990) 'Moral Approaches to Reflective Practice' In Clift, R.T., Pugach, M.G., *Encouraging Reflective Practice in Education* London: Teachers College Press

Varner, D., Peck, S. (2003) 'Learning from learning journals: The benefits and challenges of using learning journal assignments' *Journal of Management Education* 27(1), pp 52-77

Walliman, N. (2001) 'Your Research Project – a step-by-step guide for the first time researcher' London: Sage

Wang, S. (2007) 'Roles of Students in electronic Portfolio Development' *Technology in Teaching and Learning*, 3(2), pp17-28

Webb, M., Cox, M. (2004) 'A Review of Pedagogy Related to Information and Communications Technology' *Technology, Pedagogy and Education* 13(3), pp 235-286

Wetzel, K., Strudler, N. (2006) 'Costs and Benefits of Electronic Portfolios in Teacher Education' *Journal of Computing in Education* 22(3), pp 69-78

Wetzel, K., Strudler, N., Addis, A., Luz, T. (2009) 'Trends in the use of electronic portfolios for accreditation purposes' Paper presented at the Annual Meeting of the Society for Technology and Teacher Education, Charleton, SC. Available at http://coe.nevada.edu/nstrudler/SITE_09_Wetzel-Strudler.ppdf (accessed on 27.09.12)

Watt, D. (2007) 'On becoming a qualitative researcher: The value of Reflexivity' *The Qualiative Report* 12(1) pp 82-101

Wearmouth, J. (2002) 'The problem space in SEN practice clear with students and themselves in mainstream' PhD by publication Milton Keynes:OU

Wheeldon, J., Ahlberg, M. (2011) 'Visualising Scoail Science Research: Maps, Methods and Meaning' London:Sage

Wilhelm, L., Puckett, K., Beisser, S., Wishart, W., Merideth, E., Sivakumaran, T. (2006) 'Lessons Learned from the implementation of electronic portfolios at Three Universities' Tech trends 50(4), pp 62-71

Wilkerson, L., Irby D.M. (1998) 'Strategies for Improving Teaching Practices: a comprehensive approach to faculty development' *Acad Med*, 73(4), pp 387-396

Willis, H., Gravestock, P., Jenkins, M. (2006) 'Throwing a pebble into the pond: e-portfolios and student engagement' available at http://resources.glas.ac.uk/shareddata/dms/2A9AEAD8BCD42A0391DCB3EDDFE86466.pdf (accessed 28.08.10)

Woodley, C., Sims, R. (2011) 'Eportfolios, professional development and employability: some student perspectives' *Campus-Wide Information Systems* 28(3) pp 164-174

Woodward, H., Nanlohy, P. (2004) 'Digital portfolios in pre-service teacher education' *Assessment in Education* 11(2), pp 167-178

Wong, D., Clarke, S., Lodge, N., Shephard, K. (2007) 'Demand-led e-learning and the elusive total solution' *British Journal of Educational Technology*, 38(1), pp 116-132

Wray, S. (2007) 'Electronic Portfolios in a Teacher education program'. *E-Learning*., 4(1), pp 40-51

Yin, R. (2003) 'Case Study Research: Design and Methods' 3rd ed Thousand Oaks CA: Sage

Yin, R. (2009) 'Case Study Research: Design and Methods' 4th ed London:Sage

Young, D. (2008) 'ePortfolios in Education: a cause for reflection' SOLSTICE 2008 Conference Edge Hill University

Young, D., Lipczynski, K. (2007a) '*Transferability of e-portfolios in education*: Phase one report' ESCalate May 2007

Young, D., Lipczynski, K .(2007b) 'ePortfolios in Education: Integration and Standardisation'. London: British Educational Research Association

Villegas-Reimers, E. (2003) 'Teacher professional development: an international review of literature' Pariss: UNESCO

Vygotsky, L. S. (1978). 'Mind in Society: Development of Higher Psychological Processes' Harvard MA, Harvard University Press

Zellers, M., Mudrey, R. (2007) 'Electronic portfolios and metacognition: A phenomenological examination of the implementation of e-portfolios from the instructors' perspective' *International Journal of Instructional Media* 34, pp 419-430

Zemsky, R., Massy, W. F. (2004) 'Thwarted innovation what happened to e-learning and why:' The Learning Alliance at the University of Pennsylvania. Available at http://www.irhe.upenn.edu/Docs/Jun2004/ThwartedInnovation.pdf (accessed 18.11.10)

Yin, R. (2003) 'Case Study Research: Design and Methods' 3rd edition Thousand Oaks CA: Sage

Zubizarreta, J. (2004) **'**The Learning Portfolio: Reflective Practice for Improving Student Learning' Bolton, MA:Anker